



#12

## SEQUENCE LISTING

<110> Zur Megede, Jan  
Barnett, Susan W.  
Egnelbrecht, Susan  
van Rensburg, Estrelita Janse

<120> POLYNUCLEOTIDES ENCODING ANTIGENIC HIV TYPE C  
POLYPEPTIDES, POLYPEPTIDES AND USES THEREOF

<130> PP01631.102 (CHIR-1631/03US)

<140> 09/899,575

<141> 2001-07-05

<150> 09/610,313

<151> 2000-07-05

<160> 143

<170> PatentIn Ver. 2.0

<210> 1

<211> 60

<212> DNA

<213> Human immunodeficiency virus

<400> 1

gacatcaagc agggccccaaggagcccttc cgcgactacg tggaccgctt cttcaagacc 60

<210> 2

<211> 60

<212> DNA

<213> Human immunodeficiency virus

<400> 2

gacatccgcc agggccccaaggagcccttc cgcgactacg tggaccgctt cttcaagacc 60

<210> 3

<211> 1479

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag  
of HIV strain AF110965

<400> 3

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ctggagaagt tgcacctgaa ccccggcctg ctggagacca gcgagggctg caagcagatc 180  
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accgtggcca cctgtactg cgtgcacgag aagatcgagg tccgcgacac caaggaggcc 300  
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gtgcaccagg ccatcagccc ccgcaccctg aacgcctggg tgaaggtgat cgaggagaag 480  
gccttcagcc ccgaggtgat ccccatgttc accgcctga gcgagggcgc cccccccag 540

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atcgcccccg gccagatgag cgagccccgc ggcagcgaca tcgcccgcac caccagcacc 720
ctgcaggagc agatcgcttg gatgaccagc aaccccccca tccccgtggg cgacatctac 780
aagcgttggg tcatcctggg cctgaacaag atcgtgaggg tgtacagccc cgtgagcatc 840
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<210> 4

<211> 1509

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag  
of HIV strain AF110967

<400> 4

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cccgccgaga gcttcgctt cgaggagacc acccccgc ccaagcagga gccaaggac 1440
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agccagtaa 1509

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<210> 5

<211> 141

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Env common region of HIV strain AF110968

<400> 5

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gccatgtacg ccccccccat cgccggcaac ctgacctgcg agagcaacat caccggcctg 120
ctgctgaccc gcgacggcgg c 141
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<210> 6

<211> 1431

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic gp120 coding region of HIV strain AF110968

<400> 6

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aagaccaccc tgttctgcac cagcgacgcc aaggcctacg agaccgaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gcccaccgac cccaaccccc aggagatcgt gctggagaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc tgcgtgaagc tgacccccct gtgctgaccc 300
ctgaagtgcc gcaacgtgaa cgccaccaac aacatcaaca gcatgatcga caacagcaac 360
aaggggcgaga tgaagaactg cagcttcaac gtgaccaccg agctgcgcga ccgcaagcag 420
gaggtgcacg ccctgttcta ccgcctggac gtggtgcccc tgcaggggcaa caacagcaac 480
gagtaccgcc tgatcaactg caacaccagc gccatcacc aggcctgccc caaggtgagc 540
ttcgacccca tccccatcca ctactgcacc cccgcgggct acgccatcct gaagtgaac 600
aaccagacct tcaacggcac cggcccctgc aacaacgtga gcagcgtgca gtgcgcccac 660
ggcatcaagc ccgtggtgag caccagctg ctgctgaacg gcagcctggc caagggcgag 720
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atgcgcgaca actggcgcaa cgagctgtac aagtacaagg tggaggagat caagcccctg 1380
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<210> 7

<211> 1944

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic gp140 coding region of HIV strain AF110968

<400> 7

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```

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tgggccaccc acgcctgcgt gcccaccgac cccaaccccc aggagatcgt gctggagaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
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aagggcgaga tgaagaactg cagcttcaac gtgaccaccg agctgcgcga ccgcaagcag 420
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atcaacaact acaccgacac catctaccgc ctgctggagg agagccagaa ccagcaggag 1860
aagaacgaga aggacctgct ggccctggac agctggcaga acctgtggaa ctggttcagc 1920
atcaccaact ggctgtggta catc 1944

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<210> 8

<211> 2466

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
gp160 coding region of HIV strain AF110968

<400> 8

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tgggccaccc acgcctgcgt gcccaccgac cccaaccccc aggagatcgt gctggagaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
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ctgaagtgcc gcaacgtgaa cgccaccaac aacatcaaca gcatgatcga caacagcaac 360
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gaggtgcacg ccctgttcta ccgcctggac gtggtgcccc tgcagggcaa caacagcaac 480
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ggcatcaagc ccgtggtgag caccagctg ctgctgaacg gcagcctggc caagggcgag 720
atcatcatcc gcagcgagaa cctggccaac aacgccaaga tcatcatcgt gcagctgaac 780
aagcccggtga agatcgtgtg cgtgcgcccc aacaacaaca cccgcaagag cgtgcgcac 840

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ggccccggcc agaccttcta cgccaccggc gagatcatcg gcgacatccg ccaggcctac 900
tgcacatcat acaagaccga gtggaacagc accctgcagg gcgtgagcaa gaagctggag 960
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ctgcag
2466

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<210> 9

<211> 2547

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
signal sequence and gp160 coding region of HIV  
strain AF110968

<400> 9

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aagaagagcg ccatcagcct gctggacacc atcgccatcg ccgtggccga gggcaccgac 2460
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cgccagggct tcgaggccgc cctgcag 2547

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<210> 10

<211> 1035

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic a  
gp41 coding region of HIV strain AF110968

<400> 10

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cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc tgctgcagct gaccgtgtgg 180
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gccctgaagt acctgggcag cctggtgcag tactggggcc tggagctgaa gaagagcgcc 900
atcagcctgc tggacaccat cgccatcgcc gtggccgagg gcaccgaccg catcatcgag 960
ttcatccagc gcatctgcgg cgccatccgc aacatcccc gccgcatccg ccagggttc 1020
gaggccgccc tgca 1035

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<210> 11

<211> 144  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Env  
 common region of HIV strain AF110975

<400> 11

agcatcatca ccctgccctg ccgcatcaag cagatcatcg acatgtggca gaaggtgggc 60  
 cgcgccatct acgccccccc catcgagggc aacatcacct gcagcagcag catcaccggc 120  
 ctgctgctgg cccgcgacgg cggc 144

<210> 12

<211> 1437

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
 gp120 coding region of HIV strain AF110975

<400> 12

agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60  
 agcaccaccc tggtctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120  
 tgggccaccc acgcctgcgt gccaccgac cccaaccccc aggagatcga gctggacaac 180  
 gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240  
 atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgctgacc 300  
 ctgaagtga ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360  
 aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420  
 aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgccccct gaacagcaac 480  
 agcagcgagt accgcctgat caactgcaac accagcgcca tcaccaggc ctgccccaaag 540  
 gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600  
 tgcaagaaca acaccagcaa cggcaccggc ccttgccaga acgtgagcac cgtgcagtgc 660  
 acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720  
 ggcggcgaga tcatcatccg cagcaagaac ctgagcaaca acgcctacac catcatcgtg 780  
 cacctgaacg acagcgtgga gatcgtgtgc acccgcccca acaacaacac ccgcaagggc 840  
 atccgcatcg gccccggcca gaccttctac gccaccgaga acatcatcgg cgacatccgc 900  
 caggcccaact gcaacatcag cgcggcgag tggaacaagg ccgtgcagcg cgtgagcgcc 960  
 aagctgcgcg agcacttccc caacaagacc atcgagttcc agcccagcag cggcggcgac 1020  
 ctggagatca ccaccacag cttcaactgc cgcggcgagt tcttctactg caacaccagc 1080  
 aagctgttca acagcagcta caacggcacc agctaccgag gcaccgagag caacagcagc 1140  
 atcatcacc tgccctgccg catcaagcag atcatcgaca tgtggcagaa ggtgggcccgc 1200  
 gccatctacg cccccccat cgagggaac atcacctgca gcagcagcat caccggcctg 1260  
 ctgctggccc gcgacggcgg cctggacaac atcaccaccg agatcttccg cccccagggc 1320  
 ggcgacatga aggacaactg gcgcaacgag ctgtacaagt acaaggtggt ggagatcaag 1380  
 cccctgggcg tggccccac cgaggccaag cgccgcgtgg tggagcgcca gaagcgc 1437

<210> 13

<211> 1950

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
 gp140 coding region of HIV strain AF110975

<400> 13

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agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60
agcaccaccc tgttctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gccaccgac cccaaccccc aggagatcga gctggacaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgcgtgacc 300
ctgaagtgca ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360
aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420
aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgcccct gaacagcaac 480
agcagcgagt accgcctgat caactgcaac accagcgcca tcaccaggc ctgccccaaag 540
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600
tgcaagaaca acaccagcaa cggcaccggc ccctgccaga acgtgagcac cgtgcagtgc 660
acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720
ggcggcgaga tcatcatccg cagcaagaac ctgagcaaca acgcctacac catcatcgtg 780
cacctgaacg acagcgtgga gatcgtgtgc acccgcccca acaacaacac ccgcaagggc 840
atccgcatcg gccccggcca gaccttctac gccaccgaga acatcatcgg cgacatccgc 900
caggcccaact gcaacatcag cgccggcgag tggaacaagg ccgtgcagcg cgtgagcgcc 960
aagctgcgcg agcacttccc caacaagacc atcagattcc agcccagcag cggcggcgac 1020
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aagctgttca acagcagcta caacggcacc agctaccgcg gcaccgagag caacagcagc 1140
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gccatctacg cccccccat cgagggcaac atcacctgca gcagcagcat caccggcctg 1260
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gccagcatca ccctgaccgc ccaggcccg cagctgctga gcggcatcgt gcagcagcag 1560
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atcaagcagc tgcaggcccg cgtgctggcc atcgagcgt acctgaagga ccagcagctg 1680
ctgggcatct ggggtgagc cggcaagctg atctgcacca ccaccgtgcc ctggaacagc 1740
agctggagca acaagaccca gggcgagatc tgggagaaca tgacctggat gcagtgggac 1800
aaggagatca gcaactacac cggcatcatc taccgcctgc tggaggagag ccagaaccag 1860
caggagcaga acgagaagga cctgctggcc ctggacagcc gcaacaacct gtggagctgg 1920
ttcaacatca gcaactggct gtggtacatc 1950
```

<210> 14

<211> 2493

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
gp160 coding region of HIV strain AF110975

<400> 14

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agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60
agcaccaccc tgttctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gccaccgac cccaaccccc aggagatcga gctggacaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgcgtgacc 300
ctgaagtgca ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360
aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420
aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgcccct gaacagcaac 480
agcagcgagt accgcctgat caactgcaac accagcgcca tcaccaggc ctgccccaaag 540
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600
tgcaagaaca acaccagcaa cggcaccggc ccctgccaga acgtgagcac cgtgcagtgc 660
acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720
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ggcggcgaga	tcatcatccg	cagcaagaac	ctgagcaaca	acgcctacac	catcatcgtg	780
cacctgaacg	acagcgtgga	gatcgtgtgc	acccgccccca	acaacaacac	ccgcaagggc	840
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caggcccaact	gcaacatcag	cgccggcgag	tggacaagg	ccgtgcagcg	cgtgagcgcc	960
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aagctgttca	acagcagcta	caacggcacc	agctaccgcg	gcaccgagag	caacagcagc	1140
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gccatctacg	cccccccat	cgagggaac	atcacctgca	gcagcagcat	caccggcctg	1260
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cccttggcg	tggccccac	cgaggccaag	cgccgcgtgg	tggagcgcg	gaagcgcgcc	1440
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accgaccgca	tcatcgaggt	gatccagcgc	atctaccgcg	ccttctgcaa	catccccgc	2460
cgcgcgcc	agggcttcga	ggccgccctg	cag			2493

<210> 15

<211> 2565

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
signal sequence and gp160 coding region of HIV  
strain AF110975

<400> 15

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ttctggatct	gcagcggcct	gggcaacctg	tgggtgaccg	tgtacgacgg	cgtgcccgtg	120
tggcgcgagg	ccagcaccac	cctgttctgc	gccagcgacg	ccaaggccta	cgagaaggag	180
gtgcacaacg	tgtgggccac	ccacgcctgc	gtgcccaccg	acccaaccc	ccaggagatc	240
gagctggaca	acgtgaccga	gaacttcaac	atgtggaaga	acgacatgg	ggaccagatg	300
cacgaggaca	tcatcagcct	gtgggaccag	agcctgaagc	cccgcgtgaa	gctgaccccc	360
ctgtgcgtga	ccctgaagtg	caccaactac	agcaccaact	acagcaacac	catgaacgcc	420
accagctaca	acaacaacac	caccgaggag	atcaagaact	gcaccttcaa	catgaccacc	480
gagctgcgcg	acaagaagca	gcagggtgtac	gccctgttct	acaagctgga	catcgtgccc	540
ctgaacagca	acagcagcga	gtaccgcctg	atcaactgca	acaccagcgc	catcaccag	600
gcctgccccca	aggtgagctt	cgacccccatc	cccatccact	actgcgcccc	cgccggctac	660
gccatcctga	agtgcagaa	caacaccagc	aacggcaccg	gccccctgcca	gaacgtgagc	720
accgtgcag	gcaccacgg	catcaagccc	gtgggtgagca	ccccctgct	gctgaacggc	780
agcctggccg	agggcggcga	gatcatcatc	cgagcaaga	acctgagcaa	caacgcctac	840
accatcatcg	tgcacctgaa	cgacagcggtg	gagatcgtgt	gcacccgccc	caacaacaac	900

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acccgcaagg gcatccgcat cggccccggc cagaccttct acgccaccga gaacatcatt 960
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cgcgtagcg ccaagctgcg cgagcacttc cccaacaaga ccatcgagtt ccagcccagc 1080
agcgggcgcg acctggagat caccacccac agcttcaact gccgcggcga gttctttctac 1140
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aaggtggggc gcgccatcta cggccccccc atcgagggca acatcacctg cagcagcagc 1320
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gagaagcgcg ccgtgggcat cggcgccgtg atcttcggct tcttgggcgc cgccggcagc 1560
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cgcctgggcc gcatcgagga ggaggcgcc gagcaggacc gcgaccgcag catccgcctg 2220
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tactggggcc tggagctgaa gaagagcgcc accagcctgc tggacagcat cgccatcgcc 2460
gtggccgagg gcaccgacgc catcatcgag gtgatccagc gcatctaccg cgccttctgc 2520
aacatcccc cccgcgtgcg ccagggtctt gaggcgccc tgacag 2565

```

<210> 16

<211> 1056

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic a  
gp41 coding region of HIV strain AF110975

<400> 16

```

gccgtgggca tcggcgccgt gatcttcggc ttcttggggc ccgcccggcag caacatgggc 60
gccgcagca tcacctgac cggccaggcc cgccagctgc tgagcggcat cgtgcagcag 120
cagagcaacc tgctgcgcgc catcgaggcc cagcagcaca tgctgcagct gaccgtgtgg 180
ggcatcaagc agctgcaggc ccgcgtgctg gccatcgagc gctacctgaa ggaccagcag 240
ctgctgggca tctggggctg cagcggcaag ctgatctgca ccaccaccgt gccctggaac 300
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cagcaggagc agaacgagaa ggacctgctg gccctggaca gccgcaacaa cctgtggagc 480
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ctgatcgccc tgcgcatcat ctctgccgtg ctgagcatcg tgaaccgcgt gcgccagggc 600
tacagcccc tgagcttcca gacctgacc cccaaccccc gcggcctgga ccgcctgggc 660
cgcatacgagc aggaggcgcg cgagcaggac cgcgaccgca gcatccgcct ggtgcagggc 720
ttcctggccc tggcctggga cgacctgcgc agcctgtgcc tggttcagcta ccaccgcctg 780
cgcgacctga tcttgggtac cggccgcgtg gtggagctgc tgggcccgcag cagccccgc 840
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cgccgcgtgc gccagggtct cgaggccgccc ctgcag 1056

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<210> 17  
 <211> 492  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 17  
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 Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Cys Tyr Met Met Lys  
 20 25 30  
 His Leu Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro  
 35 40 45  
 Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Arg Gln Leu  
 50 55 60  
 His Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn  
 65 70 75 80  
 Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Glu Val Arg Asp  
 85 90 95  
 Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Gln  
 100 105 110  
 Gln Lys Ile Gln Gln Ala Glu Ala Ala Asp Lys Gly Lys Val Ser Gln  
 115 120 125  
 Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala  
 130 135 140  
 Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys  
 145 150 155 160  
 Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly  
 165 170 175  
 Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His  
 180 185 190  
 Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala  
 195 200 205  
 Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly  
 210 215 220  
 Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr  
 225 230 235 240  
 Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val  
 245 250 255  
 Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val  
 260 265 270

Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys  
 275 280 285  
 Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala  
 290 295 300  
 Glu Gln Ser Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu  
 305 310 315 320  
 Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly  
 325 330 335  
 Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly  
 340 345 350  
 Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala  
 355 360 365  
 Asn Thr Ser Val Met Met Gln Lys Ser Asn Phe Lys Gly Pro Arg Arg  
 370 375 380  
 Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn  
 385 390 395 400  
 Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly  
 405 410 415  
 His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys  
 420 425 430  
 Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg  
 435 440 445  
 Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Glu Glu Thr  
 450 455 460  
 Thr Pro Gly Gln Lys Gln Glu Ser Lys Asp Arg Glu Thr Leu Thr Ser  
 465 470 475 480  
 Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln  
 485 490

<210> 18

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
 signal sequence of HIV strain AF110968

<400> 18

atgcgcgtga tgggcatcct gaagaactac cagcagtggg ggatgtgggg catcctgggc 60  
 ttctggatgc tgatcatcag c 81

<210> 19

<211> 72  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: synthetic  
signal sequence of HIV strain AF110975

<400> 19  
atgcgcggtgc gcgccatcct ggcgagctgg cagcagtggt ggatctgggg catcctgggc 60  
ttctggatct gc 72

<210> 20  
<211> 1479  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: synthetic Gag  
coding sequence of HIV strain AF110965

<400> 20  
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ctggagaagt tcgcctgaa ccccggcctg ctggagacca gcgagggctg caagcagatc 180  
atccgcccag tgcacccgcg cctgcagacc ggcagcgagg agctgaagag cctgttcaac 240  
accgtggcca ccctgtactg cgtgcacgag aagatcgagg tgcgcgacac caaggaggcc 300  
ctggacaaga tcgaggagga gcagaacaag tgccagcaga agatccagca ggccgaggcc 360  
gccgacaagg gcaaggtag ccagaactac cccatcgtgc agaacctgca gggccagatg 420  
gtgcaccagg ccatcagccc ccgcaccctg aacgcctggg tgaaggtagat cgaggagaag 480  
gccttcagcc ccgaggtgat ccccatgttc accgcctga gcgagggcgc cccccccag 540  
gacctaaca ccatgctgaa caccgtgggc ggccaccagg ccgcatgca gatgctgaag 600  
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ctgcaggagc agatgcctg gatgaccgc aacccccca tccccgtggg cgacatctac 780  
aagcgctgga tcctcctggg cctgaacaag atcgtgcgca tgtacagccc cgtgagcatc 840  
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tgccgcgccc cccgcaagaa gggctgctgg aagtgcggca aggagggcca ccagatgaag 1260  
gactgcaccg agcgcaggc caacttcctg ggcaagatct ggcccagcca caagggccgc 1320  
cccggcaact tcctgcagag ccgccccgag cccaccgccc ccccgcgca gagcttccgc 1380  
ttcgaggaga ccacccccgg ccagaagcag gagagcaagg accgcgagac cctgaccagc 1440  
ctgaagagcc tgctcggaac cgacccctg agccagtaa 1479

<210> 21  
<211> 1509  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: synthetic Gag  
coding sequence of HIV strain AF110967

<400> 21

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atgaagcagc tgcagcccg cctgcagacc ggcaccgagg agctgcgcag cctgtacaac 240
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caccaggcca tcagccccc caccctgaac gcctgggtga aggtgatcga ggagaaggcc 480
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<210> 22

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 22

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Leu Lys
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His Leu Val Trp Ala Ser Arg Glu Leu Glu Gly Phe Ala Leu Asn Pro
  35          40          45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Met Lys Gln Leu
  50          55          60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
  65          70          75          80

Thr Val Ala Thr Leu Tyr Cys Val His Ala Gly Ile Glu Val Arg Asp
  85          90          95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln
 100         105         110

Gln Lys Thr Gln Gln Ala Lys Glu Ala Asp Gly Lys Val Ser Gln Asn
 115         120         125

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Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile  
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 Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala  
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 Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala  
 165 170 175  
 Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln  
 180 185 190  
 Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu  
 195 200 205  
 Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln  
 210 215 220  
 Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Ala Thr Ser Thr Leu  
 225 230 235 240  
 Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val Pro Val Gly  
 245 250 255  
 Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg  
 260 265 270  
 Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu  
 275 280 285  
 Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu  
 290 295 300  
 Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val  
 305 310 315 320  
 Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro  
 325 330 335  
 Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly  
 340 345 350  
 Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn  
 355 360 365  
 Ser Val Asn Ile Met Met Gln Lys Ser Asn Phe Lys Gly Pro Arg Arg  
 370 375 380  
 Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn  
 385 390 395 400  
 Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly  
 405 410 415  
 His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys  
 420 425 430

Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg  
 435 440 445

Ser Glu Pro Ala Ala Pro Thr Val Pro Thr Ala Pro Pro Ala Glu Ser  
 450 455 460

Phe Arg Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp  
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Arg Glu Pro Tyr Arg Glu Pro Leu Thr Ala Leu Arg Ser Leu Phe Gly  
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Ser Gly Pro Leu Ser Gln  
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<210> 23

<211> 849

<212> PRT

<213> Human immunodeficiency virus

<400> 23

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 20 25 30

Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala Lys  
 35 40 45

Thr Thr Leu Phe Cys Thr Ser Asp Ala Lys Ala Tyr Glu Thr Glu Val  
 50 55 60

His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn Pro  
 65 70 75 80

Gln Glu Ile Val Leu Glu Asn Val Thr Glu Asn Phe Asn Met Trp Lys  
 85 90 95

Asn Asp Met Val Asp Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp  
 100 105 110

Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Thr Leu  
 115 120 125

Lys Cys Arg Asn Val Asn Ala Thr Asn Asn Ile Asn Ser Met Ile Asp  
 130 135 140

Asn Ser Asn Lys Gly Glu Met Lys Asn Cys Ser Phe Asn Val Thr Thr  
 145 150 155 160

Glu Leu Arg Asp Arg Lys Gln Glu Val His Ala Leu Phe Tyr Arg Leu  
 165 170 175

Asp Val Val Pro Leu Gln Gly Asn Asn Ser Asn Glu Tyr Arg Leu Ile  
 180 185 190



Asn Cys Asn Thr Ser Ala Ile Thr Gln Ala Cys Pro Lys Val Ser Phe  
 195 200 205  
 Asp Pro Ile Pro Ile His Tyr Cys Thr Pro Ala Gly Tyr Ala Ile Leu  
 210 215 220  
 Lys Cys Asn Asn Gln Thr Phe Asn Gly Thr Gly Pro Cys Asn Asn Val  
 225 230 235 240  
 Ser Ser Val Gln Cys Ala His Gly Ile Lys Pro Val Val Ser Thr Gln  
 245 250 255  
 Leu Leu Leu Asn Gly Ser Leu Ala Lys Gly Glu Ile Ile Ile Arg Ser  
 260 265 270  
 Glu Asn Leu Ala Asn Asn Ala Lys Ile Ile Ile Val Gln Leu Asn Lys  
 275 280 285  
 Pro Val Lys Ile Val Cys Val Arg Pro Asn Asn Asn Thr Arg Lys Ser  
 290 295 300  
 Val Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala Thr Gly Glu Ile Ile  
 305 310 315 320  
 Gly Asp Ile Arg Gln Ala Tyr Cys Ile Ile Asn Lys Thr Glu Trp Asn  
 325 330 335  
 Ser Thr Leu Gln Gly Val Ser Lys Lys Leu Glu Glu His Phe Ser Lys  
 340 345 350  
 Lys Ala Ile Lys Phe Glu Pro Ser Ser Gly Gly Asp Leu Glu Ile Thr  
 355 360 365  
 Thr His Ser Phe Asn Cys Arg Gly Glu Phe Phe Tyr Cys Asp Thr Ser  
 370 375 380  
 Gln Leu Phe Asn Ser Thr Tyr Ser Pro Ser Phe Asn Gly Thr Glu Asn  
 385 390 395 400  
 Lys Leu Asn Gly Thr Ile Thr Ile Thr Cys Arg Ile Lys Gln Ile Ile  
 405 410 415  
 Asn Met Trp Gln Lys Val Gly Arg Ala Met Tyr Ala Pro Pro Ile Ala  
 420 425 430  
 Gly Asn Leu Thr Cys Glu Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg  
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 Asp Gly Gly Lys Thr Gly Pro Asn Asp Thr Glu Ile Phe Arg Pro Gly  
 450 455 460  
 Gly Gly Asp Met Arg Asp Asn Trp Arg Asn Glu Leu Tyr Lys Tyr Lys  
 465 470 475 480  
 Val Val Glu Ile Lys Pro Leu Gly Val Ala Pro Thr Glu Ala Lys Arg  
 485 490 495

Arg Val Val Glu Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val Phe  
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 Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Ile  
 515 520 525  
 Thr Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln Gln  
 530 535 540  
 Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln  
 545 550 555 560  
 Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Thr Arg Ile Leu Ala Val  
 565 570 575  
 Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser  
 580 585 590  
 Gly Lys Leu Ile Cys Thr Thr Ala Val Pro Trp Asn Ser Ser Trp Ser  
 595 600 605  
 Asn Arg Ser His Asp Glu Ile Trp Asp Asn Met Thr Trp Met Gln Trp  
 610 615 620  
 Asp Arg Glu Ile Asn Asn Tyr Thr Asp Thr Ile Tyr Arg Leu Leu Glu  
 625 630 635 640  
 Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Lys Asp Leu Leu Ala Leu  
 645 650 655  
 Asp Ser Trp Gln Asn Leu Trp Asn Trp Phe Ser Ile Thr Asn Trp Leu  
 660 665 670  
 Trp Tyr Ile Lys Ile Phe Ile Met Ile Val Gly Gly Leu Ile Gly Leu  
 675 680 685  
 Arg Ile Ile Phe Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly  
 690 695 700  
 Tyr Ser Pro Leu Pro Phe Gln Thr Leu Thr Pro Asn Pro Arg Glu Pro  
 705 710 715 720  
 Asp Arg Leu Gly Arg Ile Glu Glu Glu Gly Gly Glu Gln Asp Arg Gly  
 725 730 735  
 Arg Ser Ile Arg Leu Val Ser Gly Phe Leu Ala Leu Ala Trp Asp Asp  
 740 745 750  
 Leu Arg Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Phe Ile  
 755 760 765  
 Leu Ile Ala Ala Arg Val Leu Glu Leu Leu Gly Gln Arg Gly Trp Glu  
 770 775 780  
 Ala Leu Lys Tyr Leu Gly Ser Leu Val Gln Tyr Trp Gly Leu Glu Leu  
 785 790 795 800

Lys Lys Ser Ala Ile Ser Leu Leu Asp Thr Ile Ala Ile Ala Val Ala  
805 810 815

Glu Gly Thr Asp Arg Ile Ile Glu Phe Ile Gln Arg Ile Cys Arg Ala  
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Ile Arg Asn Ile Pro Arg Arg Ile Arg Gln Gly Phe Glu Ala Ala Leu  
835 840 845

Gln

<210> 24

<211> 855

<212> PRT

<213> Human immunodeficiency virus

<400> 24

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20 25 30

Thr Val Tyr Asp Gly Val Pro Val Trp Arg Glu Ala Ser Thr Thr Leu  
35 40 45

Phe Cys Ala Ser Asp Ala Lys Ala Tyr Glu Lys Glu Val His Asn Val  
50 55 60

Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn Pro Gln Glu Ile  
65 70 75 80

Glu Leu Asp Asn Val Thr Glu Asn Phe Asn Met Trp Lys Asn Asp Met  
85 90 95

Val Asp Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp Gln Ser Leu  
100 105 110

Lys Pro Arg Val Lys Leu Thr Pro Leu Cys Val Thr Leu Lys Cys Thr  
115 120 125

Asn Tyr Ser Thr Asn Tyr Ser Asn Thr Met Asn Ala Thr Ser Tyr Asn  
130 135 140

Asn Asn Thr Thr Glu Glu Ile Lys Asn Cys Thr Phe Asn Met Thr Thr  
145 150 155 160

Glu Leu Arg Asp Lys Lys Gln Gln Val Tyr Ala Leu Phe Tyr Lys Leu  
165 170 175

Asp Ile Val Pro Leu Asn Ser Asn Ser Ser Glu Tyr Arg Leu Ile Asn  
180 185 190

Cys Asn Thr Ser Ala Ile Thr Gln Ala Cys Pro Lys Val Ser Phe Asp  
195 200 205

Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Tyr Ala Ile Leu Lys  
 210 215 220  
 Cys Lys Asn Asn Thr Ser Asn Gly Thr Gly Pro Cys Gln Asn Val Ser  
 225 230 235 240  
 Thr Val Gln Cys Thr His Gly Ile Lys Pro Val Val Ser Thr Pro Leu  
 245 250 255  
 Leu Leu Asn Gly Ser Leu Ala Glu Gly Gly Glu Ile Ile Ile Arg Ser  
 260 265 270  
 Lys Asn Leu Ser Asn Asn Ala Tyr Thr Ile Ile Val His Leu Asn Asp  
 275 280 285  
 Ser Val Glu Ile Val Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Gly  
 290 295 300  
 Ile Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala Thr Glu Asn Ile Ile  
 305 310 315 320  
 Gly Asp Ile Arg Gln Ala His Cys Asn Ile Ser Ala Gly Glu Trp Asn  
 325 330 335  
 Lys Ala Val Gln Arg Val Ser Ala Lys Leu Arg Glu His Phe Pro Asn  
 340 345 350  
 Lys Thr Ile Glu Phe Gln Pro Ser Ser Gly Gly Asp Leu Glu Ile Thr  
 355 360 365  
 Thr His Ser Phe Asn Cys Arg Gly Glu Phe Phe Tyr Cys Asn Thr Ser  
 370 375 380  
 Lys Leu Phe Asn Ser Ser Tyr Asn Gly Thr Ser Tyr Arg Gly Thr Glu  
 385 390 395 400  
 Ser Asn Ser Ser Ile Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile  
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 Asp Met Trp Gln Lys Val Gly Arg Ala Ile Tyr Ala Pro Pro Ile Glu  
 420 425 430  
 Gly Asn Ile Thr Cys Ser Ser Ser Ile Thr Gly Leu Leu Leu Ala Arg  
 435 440 445  
 Asp Gly Gly Leu Asp Asn Ile Thr Thr Glu Ile Phe Arg Pro Gln Gly  
 450 455 460  
 Gly Asp Met Lys Asp Asn Trp Arg Asn Glu Leu Tyr Lys Tyr Lys Val  
 465 470 475 480  
 Val Glu Ile Lys Pro Leu Gly Val Ala Pro Thr Glu Ala Lys Arg Arg  
 485 490 495  
 Val Val Glu Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val Ile Phe  
 500 505 510

Gly Phe Leu Gly Ala Ala Gly Ser Asn Met Gly Ala Ala Ser Ile Thr  
 515 520 525  
 Leu Thr Ala Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln  
 530 535 540  
 Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu  
 545 550 555 560  
 Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Ile Glu  
 565 570 575  
 Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly  
 580 585 590  
 Lys Leu Ile Cys Thr Thr Thr Val Pro Trp Asn Ser Ser Trp Ser Asn  
 595 600 605  
 Lys Thr Gln Gly Glu Ile Trp Glu Asn Met Thr Trp Met Gln Trp Asp  
 610 615 620  
 Lys Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr Arg Leu Leu Glu Glu  
 625 630 635 640  
 Ser Gln Asn Gln Gln Glu Gln Asn Glu Lys Asp Leu Leu Ala Leu Asp  
 645 650 655  
 Ser Arg Asn Asn Leu Trp Ser Trp Phe Asn Ile Ser Asn Trp Leu Trp  
 660 665 670  
 Tyr Ile Lys Ile Phe Ile Met Ile Val Gly Gly Leu Ile Gly Leu Arg  
 675 680 685  
 Ile Ile Phe Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly Tyr  
 690 695 700  
 Ser Pro Leu Ser Phe Gln Thr Leu Thr Pro Asn Pro Arg Gly Leu Asp  
 705 710 715 720  
 Arg Leu Gly Arg Ile Glu Glu Glu Gly Gly Glu Gln Asp Arg Asp Arg  
 725 730 735  
 Ser Ile Arg Leu Val Gln Gly Phe Leu Ala Leu Ala Trp Asp Asp Leu  
 740 745 750  
 Arg Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Leu Ile Leu  
 755 760 765  
 Val Thr Ala Arg Val Val Glu Leu Leu Gly Arg Ser Ser Pro Arg Gly  
 770 775 780  
 Leu Gln Arg Gly Trp Glu Ala Leu Lys Tyr Leu Gly Ser Leu Val Gln  
 785 790 795 800  
 Tyr Trp Gly Leu Glu Leu Lys Lys Ser Ala Thr Ser Leu Leu Asp Ser  
 805 810 815

Ile Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Ile Ile Glu Val Ile  
820 825 830

Gln Arg Ile Tyr Arg Ala Phe Cys Asn Ile Pro Arg Arg Val Arg Gln  
835 840 845

Gly Phe Glu Ala Ala Leu Gln  
850 855

<210> 25  
<211> 20  
<212> PRT  
<213> Human immunodeficiency virus

<400> 25  
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Phe Phe Lys Thr  
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<210> 26  
<211> 60  
<212> DNA  
<213> Human immunodeficiency virus

<400> 26  
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<210> 27  
<211> 20  
<212> PRT  
<213> Human immunodeficiency virus

<400> 27  
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Phe Phe Lys Thr  
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<210> 28  
<211> 47  
<212> PRT  
<213> Human immunodeficiency virus

<400> 28  
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Cys Glu Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly

<210> 29  
 <211> 48  
 <212> PRT  
 <213> Human immunodeficiency virus

<400> 29  
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<210> 30  
 <211> 2469  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: PR975(+)

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 cccgcgggcc tgaagaagaa gaagagcgtg accgtgctgg acgtgggcga cgcctacttc 1020  
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 cgccagctgt gcaagctgct gcgcggcgcc aaggccctga ccgacatcgt gcccctgacc 1560  
 gaggaggccg agctggagct ggccgagaac cgcgagatcc tgcgcgagcc cgtgcacggc 1620  
 gtgtactacg accccagcaa ggacctgggtg gccgagatcc agaagcaggg ccacgaccag 1680  
 tggacctacc agatctacca ggagcccttc aagaacctga agaccggcaa gtacgccaag 1740

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cgcaagggtg tggtcctgga cggcatcgat ggcggcatcg tgatctacca gtacatggac 2400
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ggtgaattc 2469

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<210> 31

<211> 2463

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PR975YM

<400> 31

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cacatcgccc gcaactgccg cggccccgc aagaagggtc gctggaagtg cggcaaggag 180
ggccaccaga tgaaggactg caccgagcgc caggccaact tcttcgcga ggacctggcc 240
ttccccagg gcaaggcccg cgagttcccc agcgagcaga accgcgcaa cagccccacc 300
agccgcgagc tgcaggtgcg cggcgacaac ccccgagcg aggcggcgcc cgagcgccag 360
ggcaccctga acttccccca gatcaccctg tggcagcgcc ccctgggtgag catcaagggtg 420
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9738

<210> 46

<211> 97

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Env Optimized common region short

<400> 46  
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catgtacgcc ccccccatcg ccggcaacat cacctgc 97

<210> 47  
<211> 144  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C Env  
Optimized common region

<400> 47  
ctgcccata caactgcagt caagatcaag cagatcgtgc gcatgtggca gggcgtgggc 60  
caggccatgt acgccccccc catcgccggc aacatcacct gccgcagcaa catcaccggc 120  
atcctgctga ccgcgcagcg cggc 144

<210> 48  
<211> 144  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C Env  
wild type common region

<400> 48  
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caagcaatgt atgcccctcc cattgcagga aacataacat gtagatcaaa catcacagga 120  
atactattga cacgtgatgg ggga 144

<210> 49  
<211> 2610  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
Envgp160 optimized

<400> 49  
atgcgcgtga tgggcaccca gaagaactgc cagcagtggt ggatctgggg catcctgggc 60  
ttctggatgc tgatgatctg caacaccgag gacctgtggg tgaccgtgta ctacggcgtg 120  
cccgtgtggc gcgaggccaa gaccaccctg ttctgcgcca gcgacgcaa ggcctacgag 180  
accgaggtgc acaacgtgtg ggccaccac gcctgcgtgc ccaccgaccc caacccccag 240  
gagatcgtgc tgggcaacgt gaccgagaac ttcaacatgt ggaagaacaa catggccgac 300  
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 360  
acccccctgt gcgtgaccct gaactgcacc gacaccaacg tgaccggcaa ccgcaccgtg 420  
accggcaaca ccaacgacac caacatcgcc aacgccacct acaagtacga ggagatgaag 480  
aactgcagct tcaacgccac caccgagctg cgcgacaaga agcacaagga gtacgccctg 540  
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cccatccact actgcgcccc cgccgactac gccatcctga agtgcaacaa caagaccttc 720  
aacggcaccg gccctgtcta caacgtgagc accgtgcagt gcacccacgg catcaagccc 780  
gtggtgagca cccagctgct gctgaacggc agcctggccg aggagggcat catcatccgc 840  
agcgagaacc tgaccgagaa caccaagacc atcatcgtgc acctgaacga gagcgtggag 900

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ggcggttca acaacaccaa caacgacacc gaggagacct tccgccccgg cggcggcgac 1440
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aagaagagcg ccatcagccc cctggacacc atcgccatcg ccgtggccga gggcaccgac 2520
cgcatcatcg agctggtgca gcgcatctgc cgcgccatcc tgaacatccc ccgcccgcac 2580
cgccagggtc tcgaggccgc cctgctgtaa 2610

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<210> 50

<211> 2610

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:HIV Type C  
Envgp160 wild type

<400> 50

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atgagagtga tggggacaca gaagaattgt caacaatggt ggatatgggg catcttaggc 60
ttctggatgc taatgatttg taacacggag gacttgtggg tcacagtcta ctatgggga 120
cctgtgtgga gagaagcaaa aactactcta ttctgtgcat cagatgctaa agcatatgag 180
acagaagtgc ataatgtctg ggctacacat gcttgtgtac ccacagaccc caaccacaa 240
gaaatagttt tgggaaatgt aacagaaaat tttaatatgt ggaaaaataa catggcagat 300
cagatgcatg aggatataat cagtttatgg gatcaaagcc taaagccatg tgtaaagttg 360
acccactct gtgtcacttt aaactgtaca gatacaaatg ttacaggtaa tagaactgtt 420
acaggtataa caaatgatac caatattgca aatgctacat ataagtatga agaaatgaaa 480
aattgctctt tcaatgcaac cacagaatta agagataaga aacataaaga gtatgcactc 540
ttttataaac ttgatatagt accacttaat gaaaatagta acaactttac atatagatta 600
ataaattgca atacctcaac cataacacaa gcctgtccaa aggtctcttt tgaccggatt 660
cctatacatt actgtgctcc agctgattat gcgattctaa agtgtaataa taagacattc 720
aatgggacag gacctgttta taatgtcagc acagtacaat gtacacatgg aattaagcca 780
gtggtatcaa ctcaactact gttaaatggg agtctagcag aagaagggat aataattaga 840
tctgaaaatt tgacagagaa taccaaaaca ataatagtac atcttaatga atctgtagag 900
attaattgta caaggcccaa caataatata aggaaaagtg taaggatagg accaggacaa 960
gcattctatg caacaaatga cgtaatatga aacataagac aagcacattg taacattagt 1020

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acagatagat	ggaataaaac	tttacaacag	gtaatgaaa	aattaggaga	gcatttcct	1080
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tttaattgta	gaggagaatt	tttctattgc	aatacatcaa	acctgtttaa	tagtacatac	1200
taccctaaga	atggtagaca	caaatacaat	ggttaattcaa	gcttaccat	cacactccaa	1260
tgcaaaataa	aacaaattgt	acgcatgtgg	caaggggtag	gacaagcaat	gtatgcccct	1320
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aaaaagagtg	ctattagtc	gcttgatacc	atagcaatag	cagtagctga	aggaacagat	2520
aggattatag	aattggtaca	aagaatttgt	agagctatcc	tcaacatacc	taggagaata	2580
agacagggct	ttgaagcagc	tttgctataa				2610

<210> 51

<211> 1494

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Gag optimized

<400> 51

atgggccc	gcgccagcat	cctgagcggc	ggcaagctgg	acaagtggga	gcgcacccgc	60
ctgcgccccg	gcggcaagaa	gcactacatg	ctgaagcacc	tggtgtgggc	cagccgcgag	120
ctggagcgct	tcgccctgaa	ccccggcctg	ctggagacca	gcgagggtg	caagcagatc	180
atcaagcagc	tgacgcccgc	cctgcagacc	ggcaccgagg	agctgcgcag	cctgttcaac	240
accgtggcca	ccctgtactg	cgtgcacaag	ggcatcgagg	tgcgcgacac	caaggaggcc	300
ctggacaaga	tcgaggagga	gcagaacaag	tgccagcaga	aggcccagca	ggccaaggcc	360
gccgacgaga	aggtgagcca	gaactacccc	atcgtgcaga	acgcccaggg	ccagatggtg	420
caccaggcca	tcagcccccg	caccctgaac	gcctggatca	aggtgatcga	ggagaaggcc	480
ttcaaccccg	aggagatccc	catgttcacc	gccctgagcg	agggcgccac	cccccaggac	540
ctgaacacca	tgctgaacca	cgtggggcgc	caccaggccg	ccatgcagat	gctgaaggac	600
accatcaacg	aggaggccgc	cgagtgggac	cgaccccacc	ccgtgcacgc	cggccccgtg	660
gcccccgccc	agatgcgcga	gccccgcggc	agcgacatcg	ccggcaccac	cagcaccctg	720
caggagcaga	tcgcctggat	gaccagcaac	ccccccatcc	ccgtggagga	catctacaag	780
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gacatcaagc	agggccccaa	ggagcccttc	cgcgactacg	tgaccgctt	cttcaagacc	900
ctgcgcgccc	agcaggccac	ccaggacgtg	aagaactgga	tgaccgacac	cctgctggtg	960
cagaacgcca	acccgactg	caagaccatc	ctgcgcgccc	tgggccccgg	cgccagcctg	1020
gaggagatga	tgaccgctg	ccagggcgtg	ggcgccccca	gccacaaggc	ccgcgtgctg	1080
gccgaggcca	tgagccaggc	caacagcaac	atcctggtgc	agcgagcaa	cttcaagggc	1140

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agcaaccgca tcatcaagtg cttcaactgc ggcaagggtg gccacatcgc ccgcaactgc 1200
cgcgcccccc gcaagaaggg ctgctggaag tgcggccagg agggccacca gatgaaggac 1260
tgcaccgagc gccaggccaa cttcctgggc aagatctggc ccagccacaa gggccgcccc 1320
ggcaacttcc tgcagaaccg ccccgagccc accgcccccc ccgccgagcc caccgcccc 1380
cccgcgaga gcttccgctt cgaggagacc acccccgtgc cccgcaagga gaaggagcgc 1440
gagcccctga ccagcctgaa gagcctgttc ggcagcgacc ccctgagcca gtaa 1494

```

<210> 52

<211> 1494

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag  
Wild Type

<400> 52

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atgggtgcga gagcgtcaat attaagcggc ggaaaattag ataatggga aagaattagg 60
ttaaggccag ggggaaagaa acattatatg ttaaaacatc tagtatgggc aagcaggagg 120
ctggaaagat ttgcacttaa ccctggcctg ttagaaacat cagaaggctg taaacaaata 180
ataaaacagc tacaaccagc tcttcagaca ggaacagagg aacttagatc attattcaac 240
acagtagcaa ctctctattg tgtacataaa gggatagagg tacgagacac caaggaagcc 300
ttagacaaga tagaggaaga acaaaacaaa tgtcagcaaa aagcacaaca ggcaaaagca 360
gctgacgaaa aggtcagtc aaattatcct atagtacaga atgccaagg gcaaatggta 420
caccaagcta tatcacctag aacattgaat gcattggata aagtaataga ggaaaaggct 480
ttcaatccag aggaaatacc catgtttaca gcattatcag aaggagccac cccacaagat 540
ttaaacacaa tgttaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
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agatggataa ttctggggtt aaataaaaata gtaagaatgt atagccctgt tagcattttg 840
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ccagcagaga gcttcagggt cgaggagaca acccccgtgc cgaggaagga gaaagagagg 1440
gaacctttaa cttccctcaa atcactctt ggacgcgacc cttgtctca ataa 1494

```

<210> 53

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag  
Major Homology Region Optimized

<400> 53

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gacatcaagc agggccccaa ggagcccttc cgcgactacg tggaccgctt ctccaagacc 60

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<210> 54

<211> 60

<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag  
Major Homology Region Wild Type

<400> 54

gacataaaac aagggccaaa agaacccttt agagactatg tagaccggtt ctttaaaacc 60

<210> 55

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Nef  
Optimized

<400> 55

atgggcggca agtggagcaa ggcgagcatc gtgggctggc ccgccgtgcg cgagcgcatg 60  
cgccgcaccg agcccgccgc cgagggcggtg ggccgcgccca gccaggacct ggaccgccac 120  
ggcgccctga ccagcagcaa ccccccgcc accaacgagg cctgcgcctg gctgcaggcc 180  
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gaggacaact gcctgctgca ccccatgagc cagcacggcg ccgaggacga ggaccgagag 540  
gtgctgaagt ggaagtccga cagcctgctg gccaccgcc acatggcccc cgagctgcac 600  
cccaggtact acaaggactg ctga 624

<210> 56

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Nef  
Wild Type

<400> 56

atgggaggca agtgggtcaaa acgcagcata gttggatggc ctgcagtaag agaaagaatg 60  
agaagaactg agccagcagc agagggagta ggagcagcgt ctcaagactt agatagacat 120  
ggggcactta caagcagcaa cacacctgct actaatgaag cttgtgcctg gctgcaagca 180  
caagaggagg acggagatgt aggttttcca gtcagacctc aggtaccttt aagaccaatg 240  
acttataaga gtgcagtaga tctcagcttc tttttaaaag aaaagggggg actggaaggg 300  
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gaagacaact gtttgctaca ccctatgagc caacatggag cagaggatga agatagagaa 540  
gtattaaagt ggaagtttga cagccttcta gcacacagac acatggcccc cgagctacat 600  
ccggagtatt acaagactg ctga 624

<210> 57

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
NefD125G Optimized

<400> 57

```
atgggcgga agtggagcaa ggcgagcatc gtgggctggc ccgccgtgag cgagcgcatg 60
cgccgcaccg agcccgccgc cgagggcggt ggcccgcca gccaggacct ggaccgccac 120
ggcgccctga ccagcagcaa ccccccgcc accaacgagg cctgcgcctg gctgcaggcc 180
caggaggagg acggcgacgt gggcttcccc gtgcgcccc aggtgcccc gcgccccatg 240
acctacaaga ggcgctgga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gccgcaagcg ccaggagatc ctggacctgt ggggtgtaca caccagggc 360
ttcttccccg gctggcagaa ctacaccagc ggccccggcg tgcgcttccc cctgaccttc 420
ggctggtgct tcaagctggt gcccgtggac ccccgcgagg tgaaggaggc caacgagggc 480
gaggacaact gcctgctgca ccccatgagc cagcacggcg ccgaggacga ggaccgcgag 540
gtgctgaagt ggaagttega cagcctgctg gccaccgcc acatggcccg cgagctgcac 600
cccagtgact acaaggactg ctga 624
```

<210> 58

<211> 354

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
p15RNaseH Optimized

<400> 58

```
accttctacg tggacggcgc caccaaccgc gaggccaaga tcggcaaggc cggctacgtg 60
accgaccgag gccgcccagaa gatcgtgacc ctgaccaaca ccaccaacca gaagaccgag 120
ctgcaggcca tccagctggc cctgcaggac agcggcagcg aggtgaacat cgtgaccgac 180
agccagtacg ccctgggcat catccaggcc cagcccagca agagcgacag cgagatcttc 240
aaccagatca tcgagcagct gatcaacaag gagcgcattt acctgagctg ggtgcccgcc 300
cacaagggca tcggcgccaa cgagcagggt gacaagctgg tgagcaaggg catc 354
```

<210> 59

<211> 354

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
p15RNaseH Wild Type

<400> 59

```
actttctatg tagatggagc aactaatagg gaagctaaaa taggaaaagc agggatatgtt 60
actgacagag gaaggcagaa aattgttact ctaactaaca caacaaatca gaagactgag 120
ttacaagcaa ttcagctagc tctgcaggat tcaggatcag aagtaaacad agtaacagac 180
tcacagtatg cattaggaat cattcaagca caaccagata agagtgactc agagatattt 240
aaccataata tagaacagtt aataaacaag gaaagaattt acctgtcatg ggtaccagca 300
cataaaggaa ttgggggaaa tgaacaagta gataaattag taagtaaggg aatt 354
```

<210> 60

<211> 876

<212> DNA

<213> Artificial Sequence



<220>

<223> Description of Artificial Sequence: HIV Type C  
p31Int Optimized

<400> 60

```
cgcaaggtgc tgttcctgga cggcatcgac aaggcccagg aggagcacga gcgctaccac 60
agcaactggc gcgccatggc caacgagttc aacctgcccc ccatcgtggc caaggagatc 120
gtggccagct gcgacaagtg ccagctgaag ggcgaggcca tccacggcca ggtggactgc 180
agccccggca tctggcagct ggactgcacc cacctggagg gcaagatcat cctgggtggc 240
gtgcacgtgg ccagcggcta catggaggcc gaggtgatcc ccgccgagac cggccaggag 300
accgcctact tcatcctgaa gctggccggc cgctggcccg tgaaggtgat ccacaccgac 360
aacggcagca acttcaccag caccgccgtg aaggccgctt gctgggtggc cggcatccag 420
caggagttcg gcacccccta caacccccag agccaggggc tggtggagag catgaacaag 480
gagctgaaga agatcatcgg ccaggtgcgc gaccaggccg agcacctgaa gaccgcccgtg 540
cagatggccg tgttcattcca caacttcaag cgcaaggggc gcatcggcgg ctacagcgcc 600
ggcgagcgca tcatcgacat catcgccacc gacatccaga ccaaggagct gcagaagcag 660
atccatcgca tccagaactt ccgcgtgtac taccgcgaca gccgcgaccc catctggaag 720
ggccccggcg agctgctgtg gaaggcgag ggcgtggtgg tgatcgagga caaggcgac 780
atcaaggtgg tgccccggcg caaggccaag atcatcggc actacggcaa gcagatggcc 840
ggcgccgact gcgtggccgg cggccaggac gaggac 876
```

<210> 61

<211> 876

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
p31Int Wild Type

<400> 61

```
aggaaagtgt tgtttctaga tggaatagat aaagctcaag aagagcatga aaggtaccac 60
agcaattgga gagcaatggc taatgagttt aatctgccac ccatagtagc aaaagaaata 120
gtagctagct gtgataaatg tcagctaaaa ggggaagcca tacatggaca agtcgactgt 180
agtccagga tatggcaatt agattgtacc catttagagg gaaaaatcat cctggtagca 240
gtccatgtag ctagtggcta catggaagca gaggttatcc cagcagaaac aggacaagaa 300
acagcatatt ttatattaaa attagcagga agatggccag tcaaagtaat acatacagac 360
aatggcagta attttaccag tactgcagtt aaggcagcct gttggtgggc aggtatccaa 420
caggaatttg gaattcccta caatcccaa agtcaggagg tggtagaatc catgaataaa 480
gaattaaaga aaataatagg acaagtaaga gatcaagctg agcaccttaa gacagcagta 540
caaatggcag tattcattca caattttaa agaaaaaggg gaattggggg gtacagtgc 600
ggggaagaa taatagacat aatagcaaca gacatacaa ctaaagaatt acaaaaacaa 660
attataagaa ttcaaaattt tcgggtttat tacagagaca gcagagaccc tatttgga 720
ggaccagccg aactactctg gaaaggtgaa ggggtagtag taatagaaga taaaggtgac 780
ataaaggtag taccaaggag gaaagcaaaa atcattagag attatggaaa acagatggca 840
ggtgctgatt gtgtggcagg tggacaggat gaagat 876
```

<210> 62

<211> 3015

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Pol Optimized

<400> 62

```
ttcttccgcg agaacctggc cttccccccag ggcgaggccc gcgagttccc ccccgagcag 60
accgcgcgca acagcccccac cagccgcacc aacagcccca ccagccgcga gctgcaggtg 120
cgcgccgaca acccccgcgc cgaggagggc gagcgcgagg gcaccttcaa cttccccccag 180
atcacacctgt ggcagcgccc cctgggtgagc atcaagggtg agggccagat caaggaggcc 240
ctgctggaca cggcgccga cgacaccgtg ctggaggaga tcgacctgcc cggcaagtgg 300
aagcccaaga tgatcggcgg catcggcggc ttcataagg tgcgccagta cgaccagatc 360
ctgatcgaga tctgcggcaa gaaggccatc ggcaccgtgc tggtagggccc ccccccggtg 420
aacatcatcg gccgcaacct gctgaccag ctgggtgca ccctgaactt ccccatcagc 480
cccacgaga ccgtgcccggt gaagctgaag cccggcatgg acggcccca ggtgaagcag 540
tggccctga ccgaggagaa gatcaaggcc ctgaccgcca tctgcgagga gatggagaag 600
gaggccaaga tcaccaagat cgccccgac aaccttaca acaccccggt gttcgccatc 660
aagaagaagg acagcaccaa gtggcgcaag ctgggtgact tccgcgagct gaacaagcgc 720
accaggact tctgggagggt gcagctgggc atccccacc ccgcccgcct gaagaagaag 780
aagagcgtga ccgtgctgga cgtgggcgac gcctacttca gcgtgccccct ggacgagagc 840
ttccgcaagt acaccgcctt caccatcccc agcatcaaca acgagacccc cggcatccgc 900
taccagtaca acgtgctgcc ccagggtggt aagggcagcc ccgcatctt ccagagcagc 960
atgaccaaga tcctggagcc cttccgcgcc aagaacccc acatcgtgat ctaccagtac 1020
atggacgacc tgtacgtggg cagcgacctg gagatcgccc agcaccgcgc caagatcgag 1080
gagctgcgcg agcacctggt gaagtggggc ttcaccacc ccgacaagaa gcaccagaag 1140
gagccccct tcctgtggat gggctacgag ctgcacccc acaagtggac cgtgcagccc 1200
atcctgctgc ccgagaagga cagctggacc gtgaacgaca tccagaagct ggtgggcaag 1260
ctgaactggg ccagccagat ctaccccggc atcaaggtgc gccagctgtg caagctgctg 1320
cgcgccgcca aggcctgac cgacatcgtg cccctgaccg agggaggcca gctggagctg 1380
gccgagaacc gcgagatcct gcgcgagccc gtgcacggcg tgtactacga cccagcaag 1440
gacctgatcg ccgagatcca gaagcagggc cagcagcagt ggacctacca gatctaccag 1500
gagcccttca agaacctgaa gaccggcaag tacgccaaaga tgcgcaccac ccacaccaac 1560
gacgtgaagc agctgaccga ggcctgtag aagatcgcca tggagagcat cgtgatctgg 1620
ggcaagaccc ccaagttccg cctgcccac cagaaggaga cctgggagac ctggtggacc 1680
gactactggc aggcacctg gatccccgag tgggagttcg tgaacacccc cccctggtg 1740
aagctgtggt accagctgga gaaggacccc atcgccggcg tggagacctt ctacgtggac 1800
ggcgccacca accgcgaggg caagatcggc aaggccggct acgtgaccga ccgcgccgc 1860
cagaagatcg tgacctgac caacaccacc aaccagaaga ccgagctgca ggccatccag 1920
ctggccctgc agcgagcgg cgacaagagc gacagcgaga tcttcaacca gatcatcgag 1980
ggcatcatcc aggcacagcc cgacaagagc gacagcgaga tcttcaacca gatcatcgag 2040
cagctgatca acaaggagcg catctacctg agctgggtgc ccgcccacaa gggcatcggc 2100
ggcaacgagc aggtggacaa gctggtgagc aagggcattc gcaaggtgct gttcctggac 2160
ggcatcgaca aggcccagga ggagcacgag cgctaccaca gcaactggcg cgccatggcc 2220
aacgagttca acctgcccc catcgtggcc aaggagatcg tggccagctg cgacaagtgc 2280
cagctgaagg gcgaggccat ccacggccag gtggactgca gccccggcat ctggcagctg 2340
gactgcaccc acctggaggg caagatcatc ctggtggccg tgcacgtggc cagcggctac 2400
atggaggccg aggtgatccc cgccgagacc ggccaggaga ccgcctactt catcctgaag 2460
ctggccggcc gctggcccggt gaaggtgatc cacaccgaca acggcagcaa cttcaccagc 2520
accgcccgtg agggccgctg ctggtgggccc ggcattccagc aggagttcgg catcccctac 2580
aacccccaga gccaggcggt ggtggagagc atgaacaagg agctgaagaa gatcatcggc 2640
caggtgcgcg accaggccga gcacctgaag accgcgtgc agatggccgt gttcatccac 2700
aacttcaagc gcaaggcgcg catcgcggc tacagcgccg gcgagcgcac catcgacatc 2760
atcgccaccg acatccagac caaggagctg cagaagcaga tcatccgcac ccagaacttc 2820
cgcggtgact accgcgacag ccgcgacccc atctggaagg gccccgccga gctgctgtgg 2880
aaggcgagg gcgtggtggt gatcgaggac aaggcggaca tcaagggtgt gccccgccg 2940
aaggccaaga tcatccgcga ctacggcaag cagatggccg gcgcccactg cgtggccggc 3000
ggccaggacg aggcac 3015
```

<210> 63

<211> 3015

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Pol Wild Type

<400> 63

```
tttttttaggg aaaatttggc cttcccacaa ggggaggcca ggggaatttcc tccagaacag 60
accagagcca acagcccac cagcagaacc aacagcccca ccagcagaga gcttcagggt 120
cgaggagaca acccccgtgc cgaggaagga gaaagagagg gaaccttta cttccctcaa 180
atcactcttt ggcagcgacc ccttgtctca ataaaagtag agggccagat aaaggagggt 240
ctcttagaca caggagcaga tgatacagta ttagaagaaa tagatttgcc agggaaatgg 300
aaaccaaaaa tgataggggg aattggaggt ttatcaaaag taagacagta tgatcaaata 360
cttatagaaa tttgtggaaa aaaggctata ggtacagtat tagtagggcc tacaccagtc 420
aacataattg gaagaaatct gttaactcag cttggatgca cactaaattt tccaattagt 480
cctattgaaa ctgtaccagt aaaattaaaa ccaggaatgg atggcccaa ggtcaaacia 540
tggccattga cagaagaaaa aataaaagca ttaacagcaa tttgtgagga aatggagaag 600
gaaggaaaaa ttacaaaaat tgggcctgat aatccatata acactccagt atttgccata 660
aaaaagaagg acagtactaa gtggagaaaa ttagtagatt tcagggaact caataaaaga 720
actcaagact tttgggaagt tcaattagga ataccacacc cagcaggatt aaaaaagaaa 780
aatcagtgga cagtgtcaga tgtgggggat gcatattttt cagttccttt agatgaaagc 840
ttcagggaat atactgcatt caccatacct agtataaaca atgaaacacc agggattaga 900
tatcaatata atgtgtgcc acagggatgg aaaggatcac cagcaatatt ccagagtagc 960
atgacaaaaa tcttagagcc cttcagagca aaaaatccag acatagttat ctatcaatat 1020
atggatgact tgtatgtagg atctgactta gaaatagggc aacatagagc aaaaatagaa 1080
gagttaaggg aacatttatt gaaatgggga tttacaacac cagacaagaa acatcaaaaa 1140
gaaccccat tctttggat ggggtatgaa tccatcctg acaaatggac agtacaacct 1200
atactgtgc cagaaaagga tagttggact gtcaatgata tacagaagtt agtgggaaaa 1260
ttaactggg caagtcagat ttaccaggg attaaagtaa ggcaactctg taaactcctc 1320
aggggggcca aagcactaac agacatagta ccactaactg aagaagcaga attagaattg 1380
gcagagaaca gggaaatttt aagagaacca gtacatggag tatattatga tccatcaaaa 1440
gacttgatag ctgaaatata gaaacagggg catgaacaat ggacatatca aatttatcaa 1500
gaaccattta aaaatctgaa aacaggggaag tatgcaaaaa tgaggactac ccacactaat 1560
gatgtaaaaa cgttaacaga ggcagtgc aaataagcca tggaaagcat agtaatatgg 1620
ggaaagactc ctaaaatttag actaccatc caaaaagaaa catgggagac atgggtggaca 1680
gactattggc aagccacctg gatccctgag tgggagttt ttaatacccc tcccctagta 1740
aaattatgg accaactaga aaaagatccc atagcaggag tagaaacttt ctatgtagat 1800
ggagcaacta atagggaagc taaaatagga aaagcagggt atgttactga cagaggaagg 1860
cagaaaattg ttactctaac taacacaaca aatcagaaga ctgagttaca agcaattcag 1920
ctagctctgc aggattcagg atcagaagta aacatagtaa cagactcaca gtatgcatta 1980
ggaatcattc aagcacaacc agataagagt gactcagaga tatttaacca aataatagaa 2040
cagttaataa acaaggaaaag aatctacctg tcatgggtac cagcacataa aggaattggg 2100
ggaaatgaac aagtagataa attagtaagt aagggaatta ggaaagtgtt gtttctagat 2160
ggaatagata aagctcaaga agagcatgaa aggtaccaca gcaattggag agcaatggct 2220
aatgagttta atctgccacc catagtagca aaagaaatag tagctagctg tgataaatgt 2280
cagctaaaag gggaaagccat acatggacaa gtcgactgta gtccagggat atggcaatta 2340
gattgtacct atttagaggg aaaaatcatc ctggtagcag tccatgtagc tagtggctac 2400
atggaagcag aggttatccc agcagaagaa ggacaagaaa cagcatattt tatattaaaa 2460
ttagcaggaa gatggccagt caaagtaata catacagaca atggcagtaa ttttaccagt 2520
actgcagtta aggcagcctg ttggtgggca ggtatccaac aggaatttgg aattccctac 2580
aatcccaaaa gtcaggaggt ggtagaatcc atgaataaag aattaaagaa aataatagga 2640
caagtaagag atcaagctga gcaccttaag acagcagtag aatggcagt attcattcac 2700
aattttaaaa gaaaaggggg aattgggggg tacagtgcag gggaaagaat aatagacata 2760
atagcaacag acatacaaac taaagaatta caaaaacaaa ttataagaat tcaaaatttt 2820
cgggtttatt acagagacag cagagaccct atttggaag gaccagccga actactctgg 2880
aaaggtgaag gggtagtagt aatagaagat aaaggtgaca taaaggtagt accaaggagg 2940
aaagcaaaaa tcattagaga ttatggaaaa cagatggcag gtgctgattg tgtggcaggt 3000
ggacaggatg aagat                                     3015
```

<210> 64  
<211> 297  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
Protease Optimized

<400> 64  
ccccagatca ccctgtggca gcgccccctg gtgagcatca aggtggaggg ccagatcaag 60  
gaggccctgc tggacaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120  
aagtgggaagc ccaagatgat cggcggcatc ggcggcttca tcaaggtgcg ccagtacgac 180  
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240  
cccgtgaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttc 297

<210> 65  
<211> 297  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
Protease Wild Type

<400> 65  
cctcaaataca ctctttggca gcgaccctt gtctcaataa aagtagaggg ccagataaag 60  
gaggctctct tagacacagg agcagatgat acagtattag aagaaataga ttgcccagg 120  
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180  
caaatactta tagaaatttg tggaaaaaag gctataggta cagtattagt agggcctaca 240  
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaatttt 297

<210> 66  
<211> 297  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
Inactivated Protease Optimized

<400> 66  
ccccagatca ccctgtggca gcgccccctg gtgagcatca aggtggaggg ccagatcaag 60  
gaggccctgc tggccaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120  
aagtgggaagc ccaagatgat cggcggcatc ggcggcttca tcaaggtgcg ccagtacgac 180  
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240  
cccgtgaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttc 297

<210> 67  
<211> 297  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
Inactivated Protease Wild Type

<400> 67

```
cctcaaatca ctctttggca ggcacccctt gtctcaataa aagtagaggg ccagataaag 60
gaggctctct tagccacagg agcagatgat acagtattag aagaaataga tttgccaggg 120
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggta cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaatttt 297
```

<210> 68

<211> 1965

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Inactivated Protease Mutated Reverse  
Transcriptase Optimized

<400> 68

```
ccccagatca ccctgtggca ggcacccctg gtgagcatca aggtggaggg ccagatcaag 60
gaggccctgc tggccaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120
aagtggaaac ccaagatgat cggcggcacg ggcggttca tcaaggtgcg ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttcccc 300
atcagcccca tcgagaccgt gcccgtgaag ctgaagcccg gcatggacgg cccaaggtg 360
aagcagtggc ccctgaccga ggagaagatc aaggccctga ccgccatctg cgaggagatg 420
gagaaggagg gcaagatcac caagatcggc cccgacaacc cctacaacac ccccggttc 480
gccatcaaga agaaggacag caccaagtgg cgcaagctgg tggacttccg cgagctgaac 540
aagcgacccc aggacttctg ggaggtgcag ctgggcatcc cccaccccg cggcctgaag 600
aagaagaaga gcgtgaccgt gctggacgtg ggcgacgcct acttcagcgt gccctggac 660
gagagcttcc gcaagtacac cgccttcacc atccccagca tcaacaacga gacccccggc 720
atccgctacc agtacaacgt gctgccccag ggctggaagg gcagccccgc catcttccag 780
agcagcatga ccaagatcct ggagcccttc cgcgccaaga accccgacat cgtgatctac 840
caggcccccc tgtacgtggg cagcgacctg gagatcggcc agcaccgcgc caagatcgag 900
gagctgcgag agcacctgct gaagtggggc ttcaccaccc ccgacaagaa gcaccagaag 960
gagccccct tcctgcccac cgagctgcac cccgacaagt ggaccgtgca gcccatcctg 1020
ctgcccagaga aggacagctg gaccgtgaac gacatccaga agctggtggg caagctgaac 1080
tgggccagcc agatctaccc cggcatcaag gtgcgccagc tgtgcaagct gctgcgcggc 1140
gccaaggccc tgaccgacat cgtgcccctg accgaggagg ccgagctgga gctggccgag 1200
aaccgcgaga tcctgcgcga gcccgtgcac ggctgtact acgacccag caaggacctg 1260
atcgccgaga tccagaagca gggccacgag cagtggacct accagatcta ccaggagccc 1320
ttcaagaacc tgaagaccgg caagtacgcc aagatgcgca ccaccacac caacgacgtg 1380
aagcagctga ccgaggccgt gcagaagatc gccatggaga gcacgtgat ctggggcaag 1440
accccaagt tccgctgcc catccagaag gagacctggg agacctggtg gaccgactac 1500
tggcaggcca cctggatccc cgagtgggag ttcgtgaaca cccccccct ggtgaagctg 1560
tggtaccagc tggagaagga ccccatcgcc ggctgggaga ctttctacgt ggacggcgcc 1620
accaaccgag aggccaagat cggcaaggcc ggctacgtga ccgaccgagg ccgcccagaag 1680
atcgtgaccc tgaccaacac caccaaccag aagaccgagc tgcaggccat ccagctggcc 1740
ctgcaggaca gcggcagcga ggtgaacatc gtgaccgaca gccagtacgc cctgggcatc 1800
atccaggccc agcccacaa gagcgacagc gagatcttca accagatcat cgagcagctg 1860
atcaacaagg agcgcaccta cctgagctgg gtgcccggcc acaaggcat cggcggcaac 1920
gagcaggtgg acaagctggt gagcaagggc atccgcaagg tgctg 1965
```

<210> 69

<211> 1965

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Inactivated Protease Mutated Reverse Transcriptase  
Wild Type

<400> 69

```
cctcaaatca ctctttggca gcgaccctt gtctcaataa aagtagagg ccagataaag 60
gaggctctct tagccacagg agcagatgat acagtattag aagaaataga tttgccaggg 120
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggtta cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaattttcca 300
attagtccta ttgaaactgt accagtaaaa ttaaaaccag gaatggatgg cccaaagggtc 360
aaacaatggc cattgacaga agaaaaata aaagcattaa cagcaatttg tgaggaaatg 420
gagaagggaag gaaaaattac aaaaattggg cctgataatc catataacac tccagtattt 480
gccataaaaa agaaggacag tactaagtgg agaaaattag tagatttcag ggaactcaat 540
aaaagaactc aagacttttg ggaagttcaa ttaggaatac cacaccagc aggattaaaa 600
aagaaaaaat cagtacagtg gctagatgtg ggggatgcat atttttcagt tccttttagat 660
gaaagcttca ggaatatatac tgcattcacc atacctagta taaacaatga aacaccaggg 720
attagatata aatataatgt gctgccacag ggatggaaag gatcaccagc aatattccag 780
agtagcatga caaaaatctt agagcccttc agagcaaaaa atccagacat agttatctat 840
caagccccgt tgtatgtagg atctgactta gaaatagggc aacatagagc aaaaatagaa 900
gagttaaggg aacattttatt gaaatgggga tttacaacac cagacaagaa acatcaaaaa 960
gaacccccat ttcttcccat cgaactccat cctgacaaat ggacagtaca acctatactg 1020
ctgccagaaa aggatagttg gactgtcaat gatatacaga agttagtggg aaaattaaac 1080
tgggcaagtc agattttacc agggattaaa gtaaggcaac tctgtaaact ctcagggggg 1140
gccaaagcac taacagacat agtaccacta actgaagaag cagaattaga attggcagag 1200
aacagggaaa ttttaagaga accagtacat ggagtatatt atgatccatc aaaagacttg 1260
atagctgaaa tacagaacaa ggggcatgaa caatggacat atcaaattta tcaagaacca 1320
tttaaaaaatc tgaaaacagg gaagtatgca aaaatgagga ctaccacacac taatgatgta 1380
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tggcaagcca cctggatccc tgagtgggag tttgttaata cccctcccct agtaaaatta 1560
tggtagcaac tagaaaaaga tcccatagca ggagtagaaa ctttctatgt agatggagca 1620
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attgttactc taactaacac aacaaatcag aagactgagt tacaagcaat tcagctagct 1740
ctgagggatt caggatcaga agtaaacata gtaacagact cacagtatgc attaggaatc 1800
attcaagcac aaccagataa gagtgactca gagatattta accaaataat agaacagtta 1860
ataaacaagg aaagaatcta cctgtcatgg gtaccagcac ataaaggaat tgggggaaat 1920
gaacaagtag ataaattagt aagtaaggga attaggaaa tggtg 1965
```

<210> 70

<211> 1977

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Protease and Reverse Transcriptase Optimized

<400> 70

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cccagatca ccctgtggca gcgccccctg gtgagcatca aggtggagg ccagatcaag 60
gaggccctgc tggacaccqg cggcgacgac accgtgctgg agggatcga cctgcccggc 120
aagtggaaag ccaagatgat cggcggcacg ggcggcttca tcaaggtgag ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtgaaca tcatcgggcg caacctgctg acccagctgg gctgcaccct gaacttcccc 300
atcagcccca tcgagaccgt gcccgtgaag ctgaagcccc gcatggacgg ccccaagggt 360
```

```

aagcagtggc ccttgaccga ggagaagatc aaggccctga ccgccatctg cgaggagatg 420
gagaaggagg gcaagatcac caagatcggc cccgacaacc cctacaacac ccccggtgtc 480
gccatcaaga agaaggacag caccaagtgg cgcaagctgg tggacttccg cgagctgaac 540
aagcgacccc aggacttctg ggaggtgcag ctgggcatcc cccaccccg cggcctgaag 600
aagaagaaga gcgtgaccgt gctggacgtg ggcgacgcct acttcagcgt gcccctggac 660
gagagcttcc gcaagtacac cgccttcacc atccccagca tcaacaacga gacccccggc 720
atccgctacc agtacaacgt gctgccccag ggctggaagg gcagccccgc catcttccag 780
agcagcatga ccaagatcct ggagcccttc cgcgccaaga accccgacat cgtgatctac 840
cagtacatgg acgacctgta cgtgggcagc gacctggaga tcggccagca ccgcgccaag 900
atcgaggagc tgcgcgagca cctgctgaag tggggcttca ccacccccga caagaagcac 960
cagaaggagc ccccttctct gtggatgggc tacgagctgc accccgacaa gtggaccgtg 1020
cagcccatcc tgctgcccga gaaggacagc tggaccgtga acgacatcca gaagctggtg 1080
ggcaagctga actggggccag ccagatctac cccggcatca aggtgcgcca gctgtgcaag 1140
ctgctgcgcg gcgccaaggc cctgaccgac atcgtgcccc tgaccgagga ggccgagctg 1200
gagctggcgg agaaccgcga gatcctgcgc gagcccgctg acggcgtgta ctaccacccc 1260
agcaaggacc tgatcgccga gatccagaag cagggccacg agcagtggac ctaccagatc 1320
taccaggagc ctttcaagaa cctgaagacc ggcaagtacg ccaagatgcg caccaccac 1380
accaagcagc tgaagcagct gaccgagcc gtgcagaaga tcgccatgga gagcatcgtg 1440
atctggggca agacccccaa gttccgcctg cccatccaga aggagacctg ggagacctgg 1500
tggaccgact actggcagcg cacctggatc cccgagtggg agttcgtgaa ccccccccc 1560
ctggtgaagc tgtggtacca gctggagaag gacccccatg ccggcgtgga gaccttctac 1620
gtggacggcg ccaccaaccg cgaggccaag atcggcaagg ccggctacgt gaccgaccgc 1680
ggccgccaga agatcgtgac cctgaccaac accaccaacc agaagaccga gctgcaggcc 1740
atccagctgg ccctgcagga cagcggcagc gaggtgaaca tcgtgaccga cagccagtac 1800
gccctgggca tcatccagcg ccagcccgcac aagagcgaca gcgagatctt caaccagatc 1860
atcgagcagc tgatcaacaa ggagcgcac tacctgagct gggtgcccg cccacaagggc 1920
atcgggcgca acgagcaggt ggacaagctg gtgagcaagg gcatccgcaa ggtgctg 1977

```

<210> 71

<211> 1977

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Protease and Reverse Transcriptase Wild Type

<400> 71

```

cctcaaatca ctcttttgga gcgacccctt gtctcaataa aagtagaggg ccagataaag 60
gaggctctct tagacacagg agcagatgat acagtattag aagaaataga tttgccaggg 120
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggta cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaattttcca 300
attagtccta ttgaaactgt accagtaaaa ttaaaaccag gaatggatgg cccaaagggtc 360
aaacaatggc cattgacaga agaaaaaata aaagcattaa cagcaatttg tgaggaaatg 420
gagaagggaag gaaaaattac aaaaattggg cctgataatc catataacac tccagtattt 480
gccataaaaa agaaggacag tactaagtgg agaaaattag tagatttcag ggaactcaat 540
aaaagaactc aagacttttg ggaagttcaa ttagggaatac cacaccacgc aggattaaaa 600
aagaaaaaat cagtgcagct gctagatgtg ggggatgcat atttttcagt tccttttagat 660
gaaagcttca ggaaatatac tgcattcacc atacctagta taaacaatga aacaccaggg 720
attagatatac aatataatgt gctgccacag ggatggaaag gatcaccagc aatattccag 780
agtagcatga caaaaatcct agagcccttc agagcaaaaa atccagacat agttatctat 840
caatatatgg atgacttgta tgtaggatct gacttagaaa tagggcaaca tagagcaaaa 900
atagaagagt taagggaaca tttattgaaa tggggattta caaccacga caagaaacat 960
caaaaagaac cccatttctt ttggatgggg atcctgacaa atggacagta 1020
caacctatac tgctgccaga aaaggatagt tggactgtca atgatataca gaagttagt 1080
ggaaaattaa actgggcaag tcagatttac ccagggatta aagtaaggca actctgtaaa 1140

```

```

ctcctcaggg gggccaaagc actaacagac atagtaccac taactgaaga agcagaatta 1200
gaattggcag agaacaggga aattttaaga gaaccagtac atggagtata ttatgatcca 1260
tcaaaagact tgatagctga aatacagaaa caggggcatg aacaatggac atatcaaatt 1320
tatcaagaac catttaaaaa tctgaaaaa ggaagtatg caaaaatgag gactaccac 1380
actaatgatg taaaacagtt aacagaggca gtgcaaaaaa tagccatgga aagcatagta 1440
atatggggaa agactcctaa atttagacta cccatccaaa aagaaacatg ggagacatgg 1500
tggaacagact attggcaagc cacctggatc cctgagtggg agtttgtaa taccctccc 1560
ctagtaaaat tatggtacca actagaaaaa gatcccatag caggagtaga aactttctat 1620
gtagatggag caactaatag ggaagctaaa ataggaaaag caggggtatgt tactgacaga 1680
ggaaggcaga aaattgttac tctaactaac acaacaaatc agaagactga gttacaagca 1740
attcagctag ctctgcagga ttcaggatca gaagtaaaca tagtaacaga ctacacgtat 1800
gcattaggaa tcattcaagc acaaccagat aagagtgtact cagagatatt taaccaaata 1860
atagaacagt taataaaciaa ggaagaatc tacctgtcat ggggtaccagc acataaagga 1920
attgggggaa atgaacaagt agataaatta gtaagtaagg gaattaggaa agtggtg 1977

```

<210> 72

<211> 75

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
RevExon1 Optimized

<400> 72

```

atggcgggc gcagcggcga cagcgacgag gccctgctgc aggtgggtgaa gatcatcaag 60
atcctgtacc agagc 75

```

<210> 73

<211> 76

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
RevExon1 Wild Type

<400> 73

```

atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagtgggtgaa gatcatcaaa 60
atcctctatc aaagca 76

```

<210> 74

<211> 246

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
RevExon2 Optimized

<400> 74

```

ccctacccca agcccgaggg caccgcccag gcccgccgca accgcccggc ccgctggcgc 60
gcccgccagc gccagatcca caccatcggc gacgcgatcc tgggtggcctg cctggggccgc 120
agcgccgagc ccgtgcccc gcagctgccc cccctggagc gcctgcacat caactgcagc 180
gagggcagcg gcaccagcgg caccagcag agccagggca ccaccgaggg cgtggggcgac 240
ccctaa 246

```



<210> 75  
 <211> 248  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 RevExon2 Wild Type

<400> 75  
 acccttacc caagcccgag gggactcgac aggctcggag gaatcgaaga agaaggtgga 60  
 gagcaagaca gagacagatc catacgattg gtgagcggat tcttgctcgt tgcctgggac 120  
 gatctgcgga gcctgtgcct ctccagctac caccgcttga gagacttcat attaattgca 180  
 gtgagggcag tggaaattct gggacacagc agtctcaggg gactacagag ggggtgggag 240  
 atccttaa 248

<210> 76  
 <211> 1680  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 Reverse Transcriptase Optimized

<400> 76  
 cccatcagcc ccatcgagac cgtgcccgtg aagctgaagc ccggcatgga cggccccaag 60  
 gtgaagcagt ggcccctgac cgaggagaag atcaaggccc tgaccgccat ctgagaggag 120  
 atggagaagg agggcaagat caccaagatc ggcccgcaca acccctacaa ccccccggtg 180  
 ttcgccatca agaagaagga cagcaccaag tggcgcaagc tgggtggactt ccgcgagctg 240  
 aacaagcgca ccaggactt ctgggaggtg cagctgggca tccccacccc cgccggcctg 300  
 agaagaaga agagcgtgac cgtgctggac gtgggagcag cctacttcag cgtgcccctg 360  
 gacgagagct tccgcaagta caccgccttc accatcccca gcatcaacaa cgagaccccc 420  
 ggcatccgct accagtacaa cgtgctgccc cagggtgga agggcagccc cgccatcttc 480  
 cagagcagca tgaccaagat cctggagccc ttccgcgcca agaaccgga catcgtgatc 540  
 taccagtaca tggacgacct gtacgtgggc agcgacctgg agatcggcc gacccgcgcc 600  
 aagatcgagg agctgcgcga gcacctgctg aagtggggct tcaccacccc cgacaagaag 660  
 caccagaagg agccccctt cctgtggatg ggctacgagc tgcaccccga caagtggacc 720  
 gtgcagccca tcctgctgcc cgagaaggac agctggaccg tgaacgacat ccagaagctg 780  
 gtgggcaagc tgaactgggc cagccagatc taccgagga tcaaggtgag ccagctgtgc 840  
 aagctgctgc gcggcgccaa ggccctgacc gacatcgtgc ccctgaccga ggaggccgag 900  
 ctggagctgg ccgagaaccg cgagatcctg cgcgagcccg tgcacggcgt gtactacgac 960  
 cccagcaagg acctgatcgc cgagatccag aagcagggcc acgagcagtg gacctaccag 1020  
 atctaccagg agcccttcaa gaacctgaag accggcaagt acgccaagat gcgcaccacc 1080  
 cacaccaacg acgtgaagca gctgaccgag gccgtgcaga agatcgccat ggagagcatc 1140  
 gtgatctggg gcaagacccc caagtccgc ctgcccatcc agaaggagac ctgggagacc 1200  
 tgggtgaccg actactggca ggccacctgg atccccgagt gggagtctgt gaacaccccc 1260  
 cccctggtga agctgtggta ccagctggag aaggacccca tcgccggcgt ggagaccttc 1320  
 tacgtggacg gcgccaccaa ccgcgaggcc aagatcggca aggccggcta cgtgaccgac 1380  
 cgcggccgcc agaagatcgt gacctgacc aacaccacca accagaagac cgagctgcag 1440  
 gccatccagc tggccctgca ggacagcggc agcgaggtga acatcgtgac cgacagccag 1500  
 tacgccctgg gcatcatcca ggcccagccc gacaagagcg acagcgagat cttcaaccag 1560  
 atcatcgagc agctgatcaa caaggagcgc atctacctga gctgggtgcc cgcccacaag 1620  
 ggcacgagc gcaacgagca ggtggacaag ctggtgagca agggcatccg caaggtgctg 1680

<210> 77  
 <211> 1680

<212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 Reverse Transcriptase Wild Type

<400> 77  
 ccaattagtc ctattgaaac tgtaccagta aaattaaac caggaatgga tggcccaaag 60  
 gtcaaacaat ggccattgac agaagaaaaa ataaaagcat taacagcaat ttgtgaggaa 120  
 atggagaagg aaggaaaaat tacaaaaatt gggcctgata atccatataa cactccagta 180  
 tttgccataa aaaagaagga cagtactaag tggagaaaat tagtagattt cagggaaactc 240  
 aataaaagaa ctcaagactt ttgggaagtt caattaggaa taccacaccc agcaggatta 300  
 aaaaagaaaa aatcagtgac agtgctagat gtgggggatg catatttttc agttccttta 360  
 gatgaaagct tcaggaaata tactgcattc accataccta gtataaaca tgaaacacca 420  
 gggattagat atcaatataa tgtgctgcc cagggatgga aaggatcacc agcaatattc 480  
 cagagtagca tgacaaaaat cttagagccc ttcagagcaa aaaatccaga catagtattc 540  
 tatcaatata tggtagctt gtatgtagga tctgacttag aaatagggca acatagagca 600  
 aaaatagaag agttaaggga acattttattg aaatggggat ttacaacacc agacaagaaa 660  
 catcaaaaag aacccccatt tctttggatg ggggtatgaac tccatcctga caaatggaca 720  
 gtacaaccta tactgctgcc agaaaaggat agttggactg tcaatgatat acagaagtta 780  
 gtgggaaaaa taaactgggc aagtcagatt taccagggga ttaaagtaag gcaactctgt 840  
 aaactcctca ggggggcca agcactaaca gacatagtac cactaactga agaagcagaa 900  
 ttagaattgg cagagaacag ggaatttta agagaaccag tacatggagt atattatgat 960  
 ccatcaaaag acttgatagc tgaatacag aaacaggggc atgaacaatg gacatatcaa 1020  
 atttatcaag aaccatttaa aaatctgaaa acagggaagt atgcaaaaat gaggactacc 1080  
 cacactaatg atgtaaaaca gttaacagag gcagtgcaaa aaatagccat ggaaagcata 1140  
 gtaatatggg gaaagactcc taaatttaga ctacccatcc aaaaagaaac atgggagaca 1200  
 tgggtggacag actattggca agccacctgg atccctgagt gggagtttgt taatacccct 1260  
 cccctagtaa aattatggta ccaactagaa aaagatccca tagcaggagt agaaactttc 1320  
 tatgtagatg gagcaactaa tagggaagct aaaataggaa aagcagggtta tgttactgac 1380  
 agaggaaggc agaaaattgt tactctaact aacacaacaa atcagaagac tgagttacaa 1440  
 gcaattcagc tagctctgca ggattcagga tcagaagtaa acatagtaac agactcacag 1500  
 tatgcattag gaatcattca agcacaacca gataagagt actcagagat atttaacca 1560  
 ataatagaac agttaataaa caaggaaaga atctacctgt catgggtacc agcacataaa 1620  
 ggaattgggg gaaatgaaca agtagataaa ttagtaagta agggaattag gaaagtgttg 1680

<210> 78  
 <211> 1668  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 Mutated Reverse Transcriptase Optimized

<400> 78  
 cccatcagcc ccatcgagac cgtgcccgtg aagctgaagc ccggcatgga cggccccaag 60  
 gtgaagcagt ggcccctgac cgaggagaag atcaaggccc tgaccgccat ctgagaggag 120  
 atggagaagg agggcaagat caccaagatc ggcccgcaca acccctacaa ccccccggtg 180  
 ttcgccatca agaagaagga cagcaccaag tggcgcaagc tgggtggactt ccgagagctg 240  
 aacaagcgca ccaggactt ctgggaggtg cagctgggca tccccaccc cgccggcctg 300  
 aagaagaaga agagcgtgac cgtgctggac gtgggagacg cctacttcag cgtgcccctg 360  
 gacgagagct tccgcaagta caccgccttc accatccca gcatcaaca cgagaccccc 420  
 ggcattccgt accagtacaa cgtgctgccc cagggtgga agggcagccc cgccatcttc 480  
 cagagcagca tgaccaagat cctggagccc ttccgcgcca agaaccgccga catcgtgatc 540  
 taccaggccc ccctgtacgt gggcagcgac ctggagatcg gccagcaccg cgccaagatc 600

gaggagctgc	gcgagcacct	gctgaagtgg	ggcttcacca	cccccgacaa	gaagcaccag	660
aaggagcccc	ccttcctgcc	catcgagctg	caccccgaca	agtggaccgt	gcagcccatc	720
ctgctgcccc	agaaggacag	ctggaccgtg	aacgacatcc	agaagctggt	gggcaagctg	780
aactggggcca	cccagatcta	ccccggcatc	aaggtgcgcc	agctgtgcaa	gctgctgcgc	840
ggcgccaagg	ccctgaccga	catcgtgccc	ctgaccgagg	aggccgagct	ggagctggcc	900
gagaaccgcg	agatcctgcg	cgagcccgtg	cacggcgtgt	actacgaccc	cagcaaggac	960
ctgatcgccg	agatccagaa	gcagggccac	gagcagtggg	cctaccagat	ctaccaggag	1020
cccttcaaga	acctgaagac	cggcaagtac	gccaagatgc	gcaccaccca	caccaacgac	1080
gtgaagcagc	tgaccgaggc	cgtgcagaag	atcgccatgg	agagcatcgt	gatctggggc	1140
aagaccccca	agttccgcct	gcccattccg	aaggagacct	gggagacctg	gtggaccgac	1200
tactggcagg	ccacctggat	ccccgagtgg	gagttcgtga	acaccccccc	cctggtgaag	1260
ctgtgttacc	agctggagaa	ggaccccatc	gccggcgtgg	agaccttcta	cgtggacggc	1320
gccaccaacc	gcgaggccaa	gatcggcaag	gccggctacg	tgaccgaccg	cggccgccag	1380
aagatcgtga	ccctgacca	caccaccaac	cagaagaccg	agctgcaggc	catccagctg	1440
gccttcgagg	acagcggcag	cgaggtgaac	atcgtgaccg	acagccagta	cgccctgggc	1500
atcatccagg	cccagcccga	caagagcgac	agcgagatct	tcaaccagat	catcgagcag	1560
ctgatcaaca	aggagcgcgt	ctacctgagc	tgggtgcccg	cccacaaggg	catcggcggc	1620
aacgagcagg	tggacaagct	ggtgagcaag	ggcatccgca	aggtgctg		1668

<210> 79

<211> 1668

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Mutated Reverse Transcriptase Wild Type

<400> 79

ccaattagtc	ctattgaaac	tgtaccagta	aaattaaaac	caggaatgga	tggcccaaaag	60
gtcaaacaat	ggccattgac	agaagaaaaa	ataaaagcat	taacagcaat	ttgtgaggaa	120
atggagaagg	aaggaaaaat	tacaaaaatt	gggcctgata	atccatataa	cactccagta	180
tttgccataa	aaaagaagga	cagtactaag	tggagaaaat	tagtagattt	cagggaaactc	240
aataaaaaga	atcaagactt	ttgggaagtt	caattaggaa	taccacaccc	agcaggatta	300
aaaaagaaaa	aatcagtgac	agtgcctgat	gtgggggatg	catatttttc	agttcccttta	360
gatgaaagct	tcaggaaata	tactgcattc	accataccta	gtataaacia	tgaaacacca	420
gggattagat	atcaatataa	tgtgctgcca	cagggatgga	aaggatcacc	agcaatattc	480
cagagtagca	tgacaaaaat	cttagagccc	ttcagagcaa	aaaatccaga	catagttatc	540
tatcaagccc	cgttgtatgt	aggatctgac	ttagaaatag	ggcaacatag	agcaaaaaata	600
gaagagttaa	gggaacattt	attgaaatgg	ggatttacaa	caccagacaa	gaaacatcaa	660
aaagaacccc	catttccttc	catcgaactc	catcctgaca	aatggacagt	acaacctata	720
ctgctgccag	aaaaggatag	ttggactgtc	aatgatatac	agaagttagt	gggaaaatta	780
aactgggcaa	gtcagattta	cccagggatt	aaagtaaggc	aactctgtaa	actcctcagg	840
ggggccaaag	cactaacaga	catagtacca	ctaactgaag	aagcagaatt	agaattggca	900
gagaacaggg	aaatttttaag	agaaccagta	catggagtat	attatgatcc	atcaaaaagac	960
ttgatagctg	aaatacagaa	acagggggcat	gaacaatgga	catatcaaat	ttatcaagaa	1020
ccatttaaaa	atctgaaaac	agggaagtat	gcaaaaatga	ggactaccca	cactaatgat	1080
gtaaaaacagt	taacagaggc	agtgcaaaaa	atagccatgg	aaagcatagt	aatatgggga	1140
aagactccta	aatttagact	acccatccaa	aaagaaacat	gggagacatg	gtggacagac	1200
tattggcaag	ccacctggat	ccctgagtgg	gagtttgtaa	ataccctcc	cctagtataa	1260
ttatggtacc	aactagaaaa	agatcccata	gcaggagtag	aaactttcta	tgtagatgga	1320
gcaactaata	gggaagctaa	aataggaaaa	gcagggtatg	ttactgacag	aggaaggcag	1380
aaaattgtta	ctctaactaa	cacaacaaat	cagaagactg	agttacaagc	aattcagcta	1440
gctctgcagg	atccaggatc	agaagtaaac	atagtaacag	actcacagta	tgcattagga	1500
atcattcaag	cacaaccaga	taagagtgcg	tcagagatat	ttaaccaa	aatagaacag	1560
ttaataaaca	aggaaagaat	ctacctgtca	tgggtaccag	cacataaagg	aattggggga	1620
aatgaacaag	tagataaatt	agtaagtaag	ggaattagga	aagtgttg		1668

<210> 80  
<211> 216  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
TatC22Exon1 Optimized

<400> 80  
atggagcccg tggaccccaa gctgaagccc tggaaccacc ccggcagcca gcccaagacc 60  
gccggcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120  
aagggcctgg gcatcagcta cggccgcaag aagcgccgcc agcgccgcag cgcccccccc 180  
agcggcgagg accaccagaa cccctgagc aagcag 216

<210> 81  
<211> 216  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
TatExon1 Optimized

<400> 81  
atggagcccg tggaccccaa gctgaagccc tggaaccacc ccggcagcca gcccaagacc 60  
gcctgcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120  
aagggcctgg gcatcagcta cggccgcaag aagcgccgcc agcgccgcag cgcccccccc 180  
agcggcgagg accaccagaa cccctgagc aagcag 216

<210> 82  
<211> 216  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
TatExon1 Wild Type

<400> 82  
atggagccag tagatcctaa actaaagccc tggaaccatc caggaagcca acctaaaaca 60  
gcttgtaata attgcttttg caaacactgt agctatcatt gtctagtttg ctttcagaca 120  
aaagggttag gcatttccta tggcaggaag aagcggagac agcgacgaag cgctcctcca 180  
agtgggtgaag atcatcaaaa tcctctatca aagcag 216

<210> 83  
<211> 93  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: HIV Type C  
TatExon2 Optimized

<400> 83  
cccttgcccc agggccgcgg cgacagcacc ggcagcgagg agagcaagaa gaaggtggag 60

agcaagaccg agaccgaccc ctacgactgg tga 93  
 <210> 84  
 <211> 93  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 TatExon2 Wild Type

<400> 84  
 cccttaccctc aagcccagagg ggactcgaca ggctcggagg aatcgaagaa gaagggtggag 60  
 agcaagacag agacagatcc atacgattgg tga 93

<210> 85  
 <211> 579  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 Vif Optimized

<400> 85  
 atggagaacc gctggcaggt gctgatcgtg tggcaggtgg accgcatgaa gatccgcgcc 60  
 tggaacagcc tggatgaagca ccacatgtac atcagccgcc gcgccagcgg ctgggtgtac 120  
 cgccaccact tcgagagccg ccaccccaag gtgagcagcg aggtgcacat cccctgggc 180  
 gacgcccgcc tggatgatcaa gacctactgg ggcctgcaga ccggcgagcg cgactggcac 240  
 ctggggccacg gcgtgagcat cgagtggcgc ctgcgcgagt acagcaccca ggtggacccc 300  
 gacctggccg accagctgat ccacatgcac tacttcgact gcttcaccga gagcgccatc 360  
 cgccaggcca tcctgggcca catcgtgttc cccgcgtgcg actaccaggc cggccacaag 420  
 aagggtgggca gcctgcagta cctggccctg accgccctga tcaagcccaa gaagcgcaag 480  
 ccccccctgc ccagcgtgcg caagctgggtg gaggaccgct ggaacgaccc ccagaagacc 540  
 gcgggccgcc gcggcaacca caccatgaac ggccactag 579

<210> 86  
 <211> 579  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: HIV Type C  
 Vif Wild Type

<400> 86  
 atggaaaaca gatggcaggt gctgattgtg tggcaggtgg acaggatgaa gattagagca 60  
 tggaatagtt tagtaaagca ccatatgtat atatcaagga gagctagtgg atgggtctac 120  
 agacatcatt ttgaaagcag acatccaaaa gtaagtccag aagtacatat cccattaggg 180  
 gatgctagat tagtaataaa aacatattgg ggtttgcaga caggagaaag agattggcat 240  
 ttgggtcatg gagtctccat agaatggaga ctgagagaat acagcacaca agtagaccct 300  
 gacctggcag accagctaata tcacatgcat tattttgatt gttttacaga atctgccata 360  
 agacaagcca tattaggaca catagttttt cctagggtgtg actatcaagc aggacataag 420  
 aaggtaggat ctctgcaata cttggcactg acagcattga taaaaccaa aaagagaaag 480  
 ccacctctgc ctagtgttag aaaattagta gaggatagat ggaacgaccc ccagaagacc 540  
 aggggccgca gaggaacca tacaatgaat ggacactag 579

<210> 87

<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Vpr Optimized

<400> 87

```
atggagcgcc ccccgagga ccaggggccc cagcgcgagc cctacaacga gtggaccctg 60
gagatcctgg aggagctgaa gcaggaggcc gtgcgccact tccccgccc ctggctgcac 120
agcctgggccc agtacatcta cgagacctac ggcgacacct ggaccggcgt ggaggccatc 180
atccgcgtgc tgcagcagct gctgttcac cacttccgca tcggctgcca gcacagccgc 240
atcggcatcc tgcgccagcg ccgcgcccgc aacggcgcca gccgcagc 288
```

<210> 88  
<211> 288  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Vpr Wild Type

<400> 88

```
atggaacgac cccagaaga ccaggggccg cagaggggaac catacaatga atggacacta 60
gagattctag aagaactcaa gcaggaagct gtcagacact ttcctagacc atggctccat 120
agcttaggac aatatatcta tgaaacctat ggggatactt ggacgggagt tgaagctata 180
ataagagtac tgcaacaact actgttcatt catttcagaa ttggatgcca acatagcaga 240
ataggcatct tgcgacagag aagagcaaga aatggagcca gtagatcc 288
```

<210> 89  
<211> 267  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Vpu Optimized

<400> 89

```
atgggtgagcc tgagcctggt caaggggcgtg gactaccgcc tgggcgtggg cgccctgac 60
gtggccctga tcatcgccat catcgtgtgg accatcgctt acatcgagta ccgcaagctg 120
gtgcgccaga agaagatcga ctggctgac aagcgcatcc gcgagcgcg caggacagc 180
ggcaacgaga gcgacggcga caccgaggag ctgagcacca tggtaggacat gggccacctg 240
cgctgtgtg acgccaacga cctgtaa 267
```

<210> 90  
<211> 267  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Vpu Wild Type

<400> 90

```

atggtaagtt taagtttatt taaaggagta gattatagat taggagtagg agcattgata 60
gtagcactaa tcatagcaat aatagtgtgg accatagcat atatagaata taggaaattg 120
gtaagacaaa agaaaataga ctgggttaatt aaaagaatta gggaaagagc agaagacagt 180
ggcaatgaga gtgatgggga cacagaagaa ttgtcaacaa tggaggatat ggggcatctt 240
aggcttctgg atgctaata tttgttaa 267

```

<210> 91

<211> 321

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
RevExon 1 and 2 Optimized

<400> 91

```

atggcgggcc gcagcggcga cagcgacgag gccctgctgc aggtggtgaa gatcatcaag 60
atcctgtacc agagccccta ccccaagccc gagggcaccg gccaggcccg ccgcaaccgc 120
cgccgcgct ggcgcgcccg ccagcgccag atccacacca tcggcgagcg catcctggtg 180
gcctgcctgg gccgcagcgc cgagcccggtg cccctgcagc tgccccccct ggagcgcttg 240
cacatcaact gcagcgaggg cagcggcacc agcggcaccg agcagagcca gggcaccacc 300
gagggcggtg gcgacccta a 321

```

<210> 92

<211> 324

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
RevExon 1 and 2 Wild Type

<400> 92

```

atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagtggtgaa gatcatcaaa 60
atcctctatc aaagcaacc ttacccaag cccgagggga ctgcacaggc tcggaggaaat 120
cgaagaagaa ggtggagagc aagacagaga cagatccata cgattggtga gcggattctt 180
gtcgcttgcc tgggacgatc tgcggagcct gtgcctcttc agctaccacc gcttgagaga 240
cttcatatta attgcagtga gggcagtgga acttctggga cacagcagtc tcaggggact 300
acagaggggg tgggagatcc ttaa 324

```

<210> 93

<211> 309

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
TatC22 Exon 1 and 2 Optimized

<400> 93

```

atggagcccg tggaccccaa gctgaagccc tggaaaccacc ccggcagcca gcccaagacc 60
gccggcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120
aagggcctgg gcatcagcta cggccgcaag aagcgccgcc agcggcgag ccccccccc 180
agcggcgagg accaccagaa cccctgagc aagcagcccc tgcccaggc ccgcgcgagc 240
agcaccggca gcgaggagag caagaagaag gtggagagca agaccgagac cgaccctac 300
gactggtga 309

```

<210> 94  
<211> 309  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Tat Exon 1 and 2 Optimized

<400> 94  
atggagcccg tggaccccaa gctgaagccc tggaccacc ccggcagcca gcccagacc 60  
gcctgcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120  
aagggcctgg gcatcagcta cgcccgcaag aagcgccgcc agcgccgag cgccccccc 180  
agcggcgagg accaccagaa cccctgagc aagcagcccc tgccccaggc ccgcggcgac 240  
agcaccggca gcgaggagag caagaagaag gtggagagca agaccgagac cgaccctac 300  
gactggtga 309

<210> 95  
<211> 309  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
Tat Exon 1 and 2 Wild Type

<400> 95  
atggagccag tagatcctaa actaaagccc tggaccatc caggaagcca acctaaaaca 60  
gcttgtaata attgcttttg caaacactgt agctatcatt gtctagtttg ctttcagaca 120  
aaagggttag gcatttccta tggcaggaag aagcggagac agcgacgaag cgctcctcca 180  
agtgggtgaag atcatcaaaa tcctctatca aagcagccct taccccaagc ccgaggggac 240  
tcgacaggct cggaggaatc gaagaagaag gtggagagca agacagagac agatccatac 300  
gattggtga 309

<210> 96  
<211> 624  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C  
NefD125g Optimized Myristalization Modification

<400> 96  
atggccggca agtggagcaa gcgcagcatc gtgggctggc ccgccgtgcg cgagcgcatg 60  
cgccgcaccg agcccgccgc cgagggcggtg ggccgcgcca gccaggacct ggaccgccac 120  
ggcgccctga ccagcagcaa ccccccgcc accaacgagg cctgcgcctg gctgcaggcc 180  
caggaggagg acggcgacgt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240  
acctacaaga gcgccgtgga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300  
ctgatctaca gccgcaagcg ccaggagatc ctggacctgt ggggtgtaca caccagggc 360  
ttcttccccg gctggcagaa ctacaccagc ggccccggcg tgcgcttccc cctgaccttc 420  
ggctggtgct tcaagctggt gcccgtggac ccccgcgagg tgaaggaggc caacgagggc 480  
gaggacaact gcctgtgca ccccatgagc cagcacggcg ccgaggacga ggaccgcgaq 540  
gtgctgaagt ggaagttcga cagcctgctg gcccaccgcc acatggcccc cgagctgcac 600  
cccaggtact acaaggactg ctga 624

<210> 97



<211> 2565  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Envgp160\_TV2\_C\_ZAopt

<400> 97

```

atgcgcgccc ggggcatcct gaagaactac cgccactggt ggatctgggg catcctgggc 60
ttctggatgc tgatgatgtg caacgtgaag ggcctgtggg tgaccgtgta ctacggcgtg 120
cccgtggggc gcgaggccaa gaccacctg ttctgcgcca gcgacgcaa ggcctacgag 180
aaggaggtgc acaacgtgtg ggccaccac gcctgcgtgc ccaccgaccc caacccccag 240
gaggtgatcc tgggcaacgt gaccgagaac ttcaacatgt ggaagaacga catggtggac 300
cagatgcagg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 360
acccccctgt gcgtgaccct gaactgcacc aacgccaccg tgaactacaa caacaccagc 420
aaggacatga agaactgcag cttctacgtg accaccgagc tgcgcgacaa gaagaagaag 480
gagaacgccc tgttctaccg cctggacatc gtgcccctga acaaccgcaa gaacggcaac 540
atcaacaact accgctgat caactgcaac accagcgcca tcaccagggc ctgcccgaag 600
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc cccctgaag 660
tgcaacaaca agaagttcaa cggcacggc ccctgcgaca acgtgagcac cgtgcagtgc 720
accacgggca tcaagcccgt ggtgagcacc cagctgctgc tgaacggcag cctggccgag 780
gaggagatca tcatccgcag cgagaacctg accaacaacg tgaagaccat catcgtgcac 840
ctgaacgaga gcatcgagat caagtgcacc cgccccggca acaacacccg caagagcgtg 900
cgcacgggcc ccggccaggc cttctacgcc accggcgaca tcatcgggca catccgccag 960
gcccactgca acatcagcaa gaacgagtgg aacaccaccc tgcagcgcggt gagccagaag 1020
ctgcaggagc tgttccccaa cagcaccggc atcaagttcg cccccacag cggcggcgag 1080
ctggagatca ccaccacag cttcaactgc ggcgcgaggt tcttctactg caacaccacc 1140
gacctgttca acagcaccta cagcaacggc acctgcacca acggcacctg catgagcaac 1200
aacaccgagc gcatcacctt gcagtgccgc atcaagcaga tcatcaacat gtggcaggag 1260
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gagatcaagc ccctggggcg ggccccacc cccgcggtgg ggagcgcgag 1500
aagcgcgccg tgggcctcgg gcgcgtgttc tggggcttcc tggcgcgcg cggcagcacc 1560
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cagcagcaga gcaacctgct gcgcgccatc gaggcccgag agcacaatgct gcagctgacc 1680
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cagtgggacc gcgagatcag caactacacc aacaccatct accgctgct ggaggacagc 1920
cagagccagc aggagcgcaa cgagaaggac ctgctggccc tggaccgctg gaacaacctg 1980
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cagggctaca gccccctgag cctgcagacc ctgatcccca acccccgcgg ccccgaccgc 2160
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ctgcgcggcc tgcagcgcg ctggggcacc ctgaagtacc tgggcagcct ggtgcagtac 2400
tggggcctgg agctgaagaa gagcgccatc aacctgctgg acaccatcgc catcgccgtg 2460
gccgagggca ccgaccgcat cctggagtte atccagaacc tgtgcccgcg catccgcaac 2520
gtgccccgcc gcatccgcca gggcttcgag gccgcctgc agtaa 2565

```

<210> 98  
 <211> 2565  
 <212> DNA  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Envgp160\_TV2\_C\_ZAwT

<400> 98

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atgagagcga ggggggatact gaagaattat cgacactggt ggatatgggg catcttaggc 60
ttttggatgc taatgatgtg taatgtgaag ggcttgtggg tcacagtcta ctacggggta 120
cctgtgggga gagaagcaaa aactactcta ttttgtgcat cagatgctaa agcatatgag 180
aaagaagtgc ataattgtctg ggctacacat gcctgtgtac ccacagaccc caacccacaa 240
gaagtgattt tgggcaatgt aacagaaaat tttaacatgt ggaaaaatga catggtggat 300
cagatgcagg aagatataat cagtttatgg gatcaaagcc ttaagccatg tgtaaaattg 360
acccactct gtgtcacttt aaactgtaca aatgcaactg ttaactacaa taatacctct 420
aaagacatga aaaattgctc tttctatgta accacagaat taagagataa gaaaaagaaa 480
gaaaatgcac ttttttatag acttgatata gtaccactta ataataggaa gaatgggaat 540
attaacaact atagattaat aaattgtaat acctcagcca taacacaagc ctgtccaaaa 600
gtctcgtttg acccaattcc tatacattat tgtgctccag ctggttatgc gcctctaaaa 660
tgtaataata agaaattcaa tggaaatagga ccatgcgata atgtcagcac agtacaatgt 720
acacatggaa ttaagccagt ggtatcaact caattactgt taaatggtag cctagcagaa 780
gaagagataa taattagatc tgaaaactctg caaaacaatg tcaaaacaat aatagtacat 840
cttaaatgaat ctatagagat taaaatgtaca agacctggca ataatacaag aaagagtgtg 900
agaataggac caggacaagc attctatgca acaggagaca taataggaga tataagacaa 960
gcacattgta acattagtaa aaatgaatgg aatacaactt tacaagggtt aagtcaaaaa 1020
ttacaagaac tcttccctaa tagtacaggg ataaaaattg caccacactc aggagggggac 1080
ctagaaatta ctacacatag ctttaattgt ggaggagaat ttttctattg caatacaaca 1140
gacctgttta atagtacata cagtaatggg acatgcacta atggtacatg catgtctaata 1200
aatacagagc gcatacact ccaatgcaga ataaaaacaa ttataaacat gtggcaggag 1260
gtaggagcag caatgtatgc ccctccatt gcaggaaaca taacatgtag atcaaatatt 1320
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gaaattaaac cattaggagt agcaccact gctgcaaaaa ggagagtggg ggagagagaa 1500
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atgggcgcag catcaataac gctgacggta caggccagac aattattgtc tgggtatagt 1620
caacagcaaa gtaatttgct gagggctata gaggcgcaac agcatatgtt gcaactcacg 1680
gtctggggca ttaagcagc ccaggcaaga gtcttggtta tagagagata cctacaggat 1740
caacagctcc taggactgtg gggctgctct ggaaaactca tctgcaccac taatgtgctt 1800
tggaactcta gttggagtaa taaaactcaa agtgatattt gggataacat gacctggatg 1860
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caaagccagc aggaaagaaa tgaaaaagat ttactagcat tggacagggt gaacaatctg 1980
tggaattggg ttagcataac aaattggctg tggatatata aatatattcat aatgatagta 2040
ggaggcttga taggtttaag aataattttt gctgtgctct ctctagtaaa tagagttagg 2100
cagggatact cacccttgct attgcagacc cttatcccaa acccgagggg acccgacagg 2160
ctcggaggaa tcgaagaaga aggtggagag caagacagca gcagatccat tcgattagt 2220
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cgattgagag acttcatatt aattgtagtg agagcagtgg aacttctggg acacagtagt 2340
ctcaggggac tgagaggggg gtggggaacc cttaagtatt tggggagtct tgtgcaatat 2400
tgggggtctag agttaaaaaa gagtgcattt aatctgcttg atactatagc aatagcagta 2460
gctgaaggaa cagataggat tctagaattc atacaaaacc tttgtagagg tatccgcaac 2520
gtacctagaa gaataagaca gggcttcgaa gcagctttgc aataa 2565
```

<210> 99

<211> 1491

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Gag\_TV2\_C\_ZAopt

<400> 99

```

atgggcgccc ggcgcagcat cctgcgcggc ggcaagctgg acaagtggga gaagatccgc 60
ctgcgccccg gcgcccgcaa gcactacatg ctgaagcacc tgggtgtgggc cagccgcgag 120
ctggagcgct tcgccgtgaa ccccgccctg ctggagacca gcgacggctg ccgccagatc 180
atcaagcagc tgcagcccg cctgcagacc ggcaccgagg agatccgcag cctgttcaac 240
accgtggcca ccctgtactg cgtgcacaag ggcatcgacg tgcgcgacac caaggaggcc 300
ctggacaaga tcgaggagga gcagaacaag tgccagcaga agaccagca ggccgaggcc 360
gccgacaaga aggtgagcca gaactacccc atcgtgcaga acctgcaggg ccagatggtg 420
caccaggcca tcagccccc caccctgaac gcctgggtga aggtgatcga ggagaaggcc 480
ttcagccccg aggtgatccc catgttcacc gccctgagcg agggcgccac ccccaggac 540
ctgaacacca tgctgaacac cgtgggcggc caccaggccg ccatgcagat gctgaaggac 600
accatcaacg aggaggccgc cgtgtgggac cgctgcacc ccgtgcacgc cggccccgtg 660
gcccccgccc agatgcgcga gcccccgccc agcgacatcg ccggcaccac cagcaccctg 720
caggagcaga tcgcctggat gaccagcaac cccccatcc ccgtgggcga catctacaag 780
cgctggatca tcctgggccc gaacaagatc gtgcgcatgt acagccccgt gagcatcctg 840
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ctgcgcgccc agcagagcac ccaggagggtg aagaactgga tgaccgacac cctgctggtg 960
cagaacgcca acccgactg caagaccatc ctgcgcgccc tgggccccgg cgccagcctg 1020
gaggagatga tgaccgctg ccaggcgctg ggcggcccca gccacaaggc ccgctgtgctg 1080
gccgaggcca tgagccaggc caacaacacc agcgtgatga tccagaagag caacttcaag 1140
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tgccgcgccc cccgcaagcg cggtgctgg aagtgcggca aggagggcca ccagatgaag 1260
gactgcaccg agcgccaggc caacttcctg ggcaagatct ggccagcca caagggccgc 1320
cccggcaact tcctgcagag ccgccccgag cccaccgccc cccccctgga gccaccgccc 1380
cccccgccc agagcttcaa gttcaaggag accccaagc aggagcccaa ggaccgcgag 1440
cccctgacca gcctgaagag cctgttcggc agcgacccc tgagccagta a 1491

```

<210> 100

<211> 1491

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Gag\_TV2\_C\_ZAwT

<400> 100

```

atgggtgcga gagcgtcaat attaagaggg ggaaaattag acaaattgga aaaaattagg 60
ttacggccag gggggagaaa acactatatg ctaaaacacc tagtatgggc aagcagagag 120
ctggaaagat ttgcagttaa ccctggcctt ttagagacat cagacggatg tagacaaata 180
ataaaacagc tacaaccagc tcttcagaca ggaacagagg aaattagatc attatttaac 240
acagtagcaa ctctctattg tgtacataaa gggatagatg tacgagacac caaggaagcc 300
ttagacaaga tagaggagga acaaaacaaa tgtcagcaaa aaacacagca ggcggaagcg 360
gctgacaaaa aggtcagtca aaattatcct atagtgcaga acctccaagg gcaaattgta 420
caccaggcca tatcacctag aaccttgaat gcattggtaa aagtaataga ggagaaggct 480
tttagccag aggtaatacc catgtttaca gcattatcag aaggagccac cccacaagat 540
ttaaacacca tgtaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
accatcaatg aggaggctgc agaatgggat aggttacatc cagtacatgc agggcctgtt 660
gcaccaggcc agatgagaga accaagggga agtgacatag caggaaactac tagtaccctt 720
caagaacaaa tagcatggat gacaagtaac ccacatatcc cagtagggga catctataaa 780
aggtggataa ttctgggggtt aaataaaaata gtaagaatgt acagccctgt cagcatttta 840
gacataaaac aaggacaaaa ggaacccttt agagactatg tagaccggtt cttcaaaact 900
ttaagagctg aacaatctac acaagaggta aaaaattgga tgacagacac cttgttagtc 960
caaatgcga acccagattg taagaccatt ttaagagcat taggaccagg ggcttcatta 1020
gaagaaatga tgacagcatg tcagggagtg ggaggacctt gccacaaagc aagaqttttg 1080
gctgaggcaa tgagccaagc aaacaataca agtghtaatga tacagaaaag caatttttaa 1140
ggccctagaa gagctgttaa atgtttcaac tgtggcaggg aagggcacat agccaggaat 1200
tgcagggccc ctaggaaaag gggctgttgg aaatgtggaa aggaaggaca ccaaatgaaa 1260
gactgtactg agaggcaggc taatttttta gggaaaattt ggccttccca caaggggagg 1320

```

```
ccaggaatt tccttcagag cagaccagag ccaacagccc caccactaga accaacagcc 1380
ccaccagcag agagcttcaa gttcaaggag actccgaagc aggagccgaa agacagggaa 1440
cctttaactt ccctcaaate actctttggc agcgaccctt tgtctcaata a 1491
```

<210> 101

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nef\_TV2\_C\_ZAopt

<400> 101

```
atggggcggca agtggagcaa gagcagcatc atcggctggc ccgagggtgcg cgagcgcac 60
cgccgcaccc gcagcgccgc cgagggcggtg ggagcgcca gccaggacct ggagaagcac 120
ggcgccctga ccaccagcaa caccgcccac aacaacgccg cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggttcccc gtgcgcccc aggtgcccc gcgccccatg 240
acctacaagg ccgcatcga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt gggtgtacaa caccagggc 360
ttcttccccg actggcagaa ctacaccccc ggccccggcg tgcgcttccc cctgaccttc 420
ggctggtact tcaagctgga gcccggtggc ccccgcgagg tggaggaggc caacgagggc 480
gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgcgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgac acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga 624
```

<210> 102

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nef\_TV2\_C\_ZA\_wt

<400> 102

```
atgggggggca agtgggtcaaa aagcagtata attggatggc ctgaagtaag agaaagaatc 60
agacgaacta ggtcagcagc agagggagta ggatcagcgt ctcaagactt agagaaacat 120
gggggcactta caaccagcaa cacagcccac aacaatgctg cttgcgcctg gctggaagcg 180
caagaggagg aaggagaagt aggttttcca gtcagacctc aggtaccttt aagaccaatg 240
acttataaag cagcaataga tctcagcttc tttttaaaag aaaagggggg actggaaggg 300
ttaatttact ccaagaaaag gcaagagatc ctgatttgtt gggtttataa cacacaaggc 360
ttcttcctg attggcaaaa ctacacaccg ggaccagggg tcagatttcc actgaccttt 420
ggatggtact tcaagctaga gccagtcgat ccaagggaag tagaaggagg caatgaagga 480
gaaaacaact gtttactaca ccctatgagc cagcatggaa tggaggatga agacagagaa 540
gtattaagat ggaagtttga cagtacgcta gcacgcagac acatggcccc cgagctacat 600
ccggagtatt acaaagactg ctga 624
```

<210> 103

<211> 3009

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Pol\_TV2\_C\_ZAopt

<400> 103

```
ttcttccgcg agaactggc ctccccccag ggcgaggccc gcgagttccc cagcgagcag 60
accgcgcca acagcccac caccgcacc aacagcccca ccagccgca gctgcagggtg 120
```

```

cagggcgaca gcgaggccgg cgccgagcgc cagggcacct tcaacttccc ccagatcacc 180
ctgtggcagc gccccctggt gagcatcaag gtggccggcc agaccaagga ggccctgctg 240
gacaccggcg ccgacgacac cgtgctggag gagatcaacc tgcccggcaa gtggaagccc 300
aagatcgatcg cgggcacggg cggttctatc aagggtgcgc agtacgacca gatcctgac 360
gagatctgcg gcaagcgcg ccatcgccacc gtgctggtgg gccccacccc cgtgaacatc 420
atcgcccgca acctgctgac ccagctgggc tgcacctga acttccccat cagccccatc 480
gagaccgtgc ccgtgaagct gaagcccggc atggacggcc ccaaggtgaa gcagtggccc 540
ctgaccgagg agaagatcaa ggccctgacc gagatctgcg aggagatgga gaaggagggc 600
aagatcacca agatcgggcc cgagaacccc tacaacaccc ccgtgttcgc catcaagaag 660
aaggacagca ccaagtggcg caagctggtg gacttccgcg agctgaacaa gcgcacccag 720
gacttctggg aggtgcagct gggcatcccc caccgcccg gcctgaagaa gaagaagagc 780
gtgaccgtgc tggacgtggg cgacgcctac ttcagcgtgc cctggacga gagcttccgc 840
aagtacaccg ccttcacccat ccccagcatc aacaacgaga ccccgccat ccgctaccag 900
tacaacgtgc tgcccagggg ctggaagggc agccccgcca tcttccagag cagcatgacc 960
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ttcaagaacc tgcgcaccgg caagtacgcc aagatgcgca ccgcccacac caacgacgtg 1560
aagcagctgg ccgaggccgt gcagaagatc acccaggaga gcacgtgat ctggggcaag 1620
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gccaaaccgc agaccaagat cggcaaggcc ggctacgtga ccgacaaggg ccgccagaag 1860
gtggtgagct tcaccgagac caccaaccag aagaccgagc tgcaggccat ccagctggcc 1920
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aagggcgagg ccattgcacg ccaggtggac tgcagccccg gcacatggca gctggactgc 2340
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cgcgaccagg ccgagcacct gaagaccgcc gtgcagatgg ccgtgttcac ccacaacttc 2700
aagcgcaagg gcggcatcgg cggctacagc gccggcgagc gcacatcga catcatcgcc 2760
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tactaccgcg acagccgcga ccccatctgg aagggccccg ccaagctgct gtggaagggc 2880
gagggcgccg tggtagtcca ggacaacagc gacatcaagg tgggcccccg ccgcaaggcc 2940
aagatcatca aggactacgg caagcagatg gccggcgccg actgctggc cggcccgccag 3000
gacgaggac
3009

```

<210> 104

<211> 3009

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Pol\_TV2\_C\_ZAwT

<400> 104

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tttttttaggg aaaatttggc cttcccacaa ggggaggcca gggaatttcc ttcagagcag 60
accagagcca acagcccccac cactagaacc aacagcccca ccagcagaga gcttcaagtt 120
caaggagact ccgaagcagg agccgaaaga cagggaacct ttaacttccc tcaaatcact 180
ctttggcagc gaccccttgt ctcaataaaa gtagcgggcc aaacaaagga ggctctttta 240
gatacaggag cagatgatac agtactagaa gaaataaact tgccaggaaa atggaaacca 300
aaaatgatag gaggaattgg aggttttatac aaagtaagac agtatgatca aatacttata 360
gaaatttgtg gaaaaagggc tataggtaca gtattagtag gacctacacc tgtcaacata 420
attggaagaa atctgttgac tcagcttgga tgcacactaa attttccaat tagccccatt 480
gaaactgtac cagtaaaaatt aaagccagga atggatggcc caaagggttaa acaatggcca 540
ttgacagaag aaaaaataaa agcattaaca gaaatttgtg aggaaatgga gaaggaagga 600
aaaattacaa aaattggggc tgaaaatcca tataacactc cagtatttgc cataaagaag 660
aaggacagta caaagtggag aaaattagta gatttcaggg aactcaataa aagaactcaa 720
gacttttggg aagtccaatt aggaatacca caccagcag ggtaaaaaa gaaaaaatca 780
gtgacagtac tggatgtggg agatgcatat ttttcagtc ctttagatga gagcttcaga 840
aaatatactg cattccacct acctagtata aacaatgaaa caccagggat tagatatcaa 900
tataactgtt tccacaggg atggaaagga tcaccagcaa tattccagag tagcatgaca 960
agaatcttag agcccttttag aacacaaaac ccagaagtag ttatctatca atatatggat 1020
gacttatatg taggatctga cttagaaata gggcaacata gagcaaaaat agaggagtta 1080
agaggacacc tattgaaatg gggatttacc acaccagaca agaaacatca gaaagaaccc 1140
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ctgccagaaa aggagagctg gactgtcaat gatatacaga agttagtggg aaagttaaac 1260
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aaacagttag cagaggcagt gcaaaagata acccaggaaa gcatagtaat atggggaaaa 1620
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gccaataggg aaactaaaat aggaaaagca ggtatgtca ctgacaaagg aaggcagaaa 1860
gttgtttcct tcaactgaaac aacaaatcag aagactgaat tacaagcaat tcagctagct 1920
ttgcaggatt cagggccaga agtaaacata gtaacagact cacagtatgc attaggaatc 1980
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gcagaggtta tcccagcaga aacaggacaa gaaacagcat actttatact aaaattagca 2460
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gttaaggcag cctgttggtg ggcagatatc caacgggaat ttggaattcc ctacaatccc 2580
caaagtcaag gagttagtag atccatgaat aaagaattaa agaaaatcat agggcaagta 2640
agagatcaag ctgagcacct taagacagca gtacaaatgg cagtattcat tcacaatttt 2700
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tcagacatac aaactaaaga attacaaaaa caaattataa aaattcaaaa ttttcggggt 2820
tattacagag acagcagaga ccctatttgg aaaggaccag ccaaactact ctggaaaggt 2880
gaaggggcag tagtaataca agataatagt gatataaagg tagtaccaag aaggaaagca 2940
aaaatcatta aggactatgg aaaacagatg gcaggtgctg attgtgtggc aggtagacag 3000
gataagat. 3009

```

<210> 105

<211> 75

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon1\_TV2\_C\_ZAopt

<400> 105

atggcggcc gcagcggcga cagcgacgag gccctgctgc aggccatcaa gatcatcaag 60  
atcctgtacc agagc 75

<210> 106

<211> 76

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon1\_TV2\_C\_ZAwt

<400> 106

atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagcaataaa gatcatcaag 60  
atcctctacc aaagca 76

<210> 107

<211> 246

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon2\_TV2\_C\_ZAopt

<400> 107

ccctacccca agcccagagg caccggccag gccgcgcga accgcccgcg ccgctggcgc 60  
gcccgcagc agcagatcca cagcatcagc gagcgcatcc tggacacctg cctggggcgc 120  
cccaccaagc ccgtgcccct gctgctgccc cccatcgagc gcctgcacat caactgcagc 180  
gagagcagcg gcaccagcgg caccagtag agccagggca ccgccgaggg cgtggggcaac 240  
ccctaa 246

<210> 108

<211> 248

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon2\_TV2\_C\_ZAwt

<400> 108

acccttatcc caaaccgag gggacccgac aggctcggag gaatcgaaga agaaggtgga 60  
gagcaagaca gcagcagatc cattcgatta gtgagcggat tcttgacact tgcctgggac 120  
gacctacgaa gcctgtgcct cttctgtac caccgattga gagacttcat attaattgta 180  
gtgagagcag tggaacttct gggacacagt agtctcaggg gactgcagag ggggtgggga 240  
acccttaa 248

<210> 109

<211> 216

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon1\_TV2\_C\_ZAopt

<400> 109

```
atggagccca tcgaccccaa cctggagccc tggaaccacc ccggcagcca gccaagacc 60
gcctgcaacg gctgctactg caagcgctgc agctaccact gcctggtgtg cttccagaag 120
aagggcctgg gcatctacta cggccgcaag aagcgccgcc agcgccgcag cgtccccccc 180
agcaacaagg accaccagga cccctgccc aagcag 216
```

<210> 110

<211> 216

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon1\_TV2\_C\_ZAwt

<400> 110

```
atggagccaa tagatcctaa cctagaaccc tggaaccatc caggaagtca gcctaaaact 60
gcttgtaatg ggtgttactg taaacgttgc agctatcatt gtctagtttg ctttcagaaa 120
aaaggccttag gcatttacta tggcaggaag aagcgagac agcgacgaag cgctcctcca 180
agcaataaag atcatcaaga tcctctacca aagcag 216
```

<210> 111

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon2\_TV2\_C\_ZAopt

<400> 111

```
cccctgagcc agaccgcgg cgacccacc ggcagcgagg agagcaagaa gaaggtggag 60
agcaagaccg ccgccgaccc cttcgactag 90
```

<210> 112

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon2\_TV2\_C\_ZAwt

<400> 112

```
cccttatccc aaaccgcagg ggacccgaca ggctcggagg aatcgaagaa gaaggtggag 60
agcaagacag cagcagatcc attcgattag 90
```

<210> 113

<211> 579

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vif\_TV2\_C\_ZAopt

<400> 113

```
atggagaacc gctggcaggt gctgatcgtg tggcaggtgg accgcatgaa gatccgcacc 60
tggcacagcc tggatgaagca ccacatgtac gtgagccgcc gcgccgacgg ctggttctac 120
```



```

cgccaccact acgagagccg ccaccccaag gtgagcagcg aggtgcacat cccctgggc 180
gacgcccgcg tggatgatcaa gacctactgg ggcctgcaga ccggcgagcg cgcctggcac 240
ctggggccacg gcgtgagcat cgagtggcgc ctgcgcgcgt acagcaccca ggtggacccc 300
gacctgacgg accagctgat ccacatgcac tacttcgact gcttcgccga gagcgccatc 360
cgcaaggcca tcctggggcca gatcgtgagc cccaagtgcg actaccaggc cgccacacaac 420
aagggtgggca gcctgcagta cctggccctg accgcccctga tcaagcccaa gaagatcaag 480
ccccccctgc ccagcgtgcg caagctggtg gaggaccgct ggaacaagcc ccagaagacc 540
cgcgcccgcc gcggcaacca caccatgaac ggccactag 579

```

<210> 114

<211> 579

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vif\_TV2\_C\_ZAwT

<400> 114

```

atggaaaaca gatggcaggt gctgattgtg tggcaggtag acaggatgaa gattagaaca 60
tggcacagtt tagtaaagca ccatatgtat gtttcgagga gagctgatgg atggttctac 120
agacatcatt atgaaagcag acacccaaaa gtaagttcag aagtacacat cccattagga 180
gatgccaggt tagtaataaa aacatattgg ggtctgcaga caggagaaaag agcttggcat 240
ttgggtcacg gagtctccat agaattggaga ttgagaagat atagcacaca agtagaccct 300
gacctgacag accaactaat tcatatgcat tattttgatt gttttgcaga atctgccata 360
aggaaagcca tactaggaca gatagttagc cctaagtgtg actatcaagc aggacataac 420
aaggtaggat ctctacaata cttggcactg acagcattga taaaacccaa aaagataaag 480
ccacctctgc ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaagacc 540
agggggccgca gagggaacca tacaatgaat ggacactag 579

```

<210> 115

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpr\_TV2\_C\_ZAopt

<400> 115

```

atggagcagg ccccgagga ccaggggccc cagcgcgagc cctacaacga gtggaccctg 60
gagctgctgg aggagctgaa gcaggaggcc gtgcgccact tccccgccct ctggctgcac 120
aacctgggccc agcacatcta cgagacctac ggcgacacct ggaccggcgt ggaggccatc 180
atccgcatcc tgcagcagct gctgttcate cacttccgca tcggctgccca ccacagccgc 240
atcgccatcc tgcgccagcg ccgcgcccgc aacggcgcca accgcagc 288

```

<210> 116

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpr\_TV2\_C\_ZAwT

<400> 116

```

atggaacaag ccccagaaga ccaggggccg cagaggggaa catacaatga atggacacta 60
gagcttttag aagaactcaa gcaggaaagc gtcagacact ttcctagacc atggctccat 120
aacttaggac aacatatcta tgaaacctat ggagatactt ggacaggagt tgaagcaata 180
ataagaatcc tgcaacaatt actgtttatt catttcagga ttgggtgccca tcatagcaga 240

```

ataggcattt tgcgacagag aagagcaaga aatggagcca atagatcc 288

<210> 117

<211> 261

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpu\_TV2\_C\_ZAopt

<400> 117

atgctggacc tgaccgccc catcgacagc cgcctgggca tcggcgccct gatcgtggcc 60  
ctgatcatcg ccatcatcgt gtggaccatc gtgtacatcg agtaccgcaa gctggtgcgc 120  
cagcgcaaga tcgactggct ggtgaagcgc atccgcgagc gcgccgagga cagcggcaac 180  
gagagcgagg gcgacaccga ggagctgagc accctgggtg acatggggcca cctgcgcctg 240  
ctggacgcca acgacgtga a 261

<210> 118

<211> 261

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpu\_TV2\_C\_ZAwT

<400> 118

atgttagatt taactgcaag aatagattct agattaggaa taggagcatt gatagtagca 60  
ctaatacatag caataatagt gtggaccata gtatatatag aatataggaa attggtaagg 120  
caaaggaaaa tagactgggt agttaaagg attagggaaa gagcagaaga cagtggcaat 180  
gagagcgagg gggatactga agaattatcg acactgggtg atatggggca tcttaggctt 240  
ttggatgcta atgatgtga a 261

<210> 119

<211> 1473

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp120mod.TV1.delV2

<400> 119

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ggcgtgcccg tgtggcgcca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180  
tacgagaccg aggtgcacaa cgtgtggggc acccacgcct gcgtgcccac cgaccccaac 240  
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300  
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360  
aagctgaccc ccctgtgcgt gaccctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420  
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480  
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540  
atcacccagg cctgccccaa ggtgagcttc gaccccatcc ccatccacta ctgcgcccc 600  
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aacgtgagca ccgtgcagtg caccacggc atcaagcccg tgggtgagc acagctgctg 720  
ctgaacggca ccctggccga ggagggcatc atcatccgca gcgagaacct gaccgagaac 780  
accaagacca tcatcgtgca cctgaacgag agcgtggaga tcaactgcac ccgccccaac 840  
aacaacaccc gcaagagcgt gcgcatcggc cccggccagg ccttctacgc caccaacgac 900  
gtgatcggca acatccgcca ggcccactgc aacatcagca ccgaccgctg gaacaagacc 960

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ctgcagcagg tgatgaagaa gctgggagag cacttcccca acaagaccat ccagttcaag 1020
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ttctactgca acaccagcaa cctgttcaac agcacctacc acagcaacaa cggcacctac 1140
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cgcatgtggc agggcggtgg ccaggccacc tacgcccccc ccacgcgcgg caacatcacc 1260
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aacaccgaga ccttccgccc cggcgggcgc gacatgcgcg acaactggcg cagcgagctg 1380
tacaagtaca aggtggtgga gatcaagccc ctgggcatcg cccccacaa ggccaagcgc 1440
cgcggtgtgc agcgcgagaa gcgctaactc gag 1473

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<210> 120

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp140mod.TV1.delV2

<400> 120

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ctgggcttct ggatgctgat gatctgcaac accgaggacc tgtgggtgac cgtgtactac 120
ggcgtgcccg tgtggcgaga cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtggggc acccagcct gcgtgcccac cgacccaac 240
ccccaggaga tcgtgtggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgctg 360
aagctgaccc ccctgtgctg gacctgaac tgcaccgaca ccaactgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccagg cctgccccaa ggtgagcttc gaccccatcc ccattccacta ctgcgcccc 600
gccggctacg ccattcctgaa gtgcaacaac aagaccttca acggcaccgg ccctgtctac 660
aacgtgagca ccgtgcagtg caccacggc atcaagcccc tggtagcac ccagctgctg 720
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aacctgctgg aggacagca gaaccagcag gagaagaacg agaaggacct gctggagctg 1920
gacaagtgga acaacctgtg gaactggttc gacatcagca actggccctg gtacatctaa 1980
ctcag 1986

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<210> 121

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl40mod.TV1.mut7.delV2

<400> 121

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ggcgtgcccg tgtggcgca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggcc acccagcct gcgtgccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgacct ccctgtgctg gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccagg cctgccccaa ggtgagcttc gaccccatcc ccatccacta ctgcgcccc 600
gccggctacg ccctcctgaa gtgcaacaac aagaccttca acggcaccgg cccctgctac 660
aacgtgagca ccgtgcagt caccacggc atcaagccc tggtgagcac ccagctgctg 720
ctgaacggca gcctggccga ggagggcac atcatccga gcgagaacct gaccgagaac 780
accaagacca tcctcgtgca cctgaacgag agcgtggaga tcaactgcac ccgccccaa 840
aacaacacc gcaagagcgt gcgcatcgcc cccggccagg ccttctacgc caccaacgac 900
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aacctgctgg aggacagcca gaaccagcag gagaagaacg agaaggacct gctggagctg 1920
gacaagtgga acaacctgtg gaactgggtc gacatcagca actggccctg gtacatctaa 1980
ctcgag
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<210> 122

<211> 2397

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl60mod.TV1.delV1V2

<400> 122

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tacgagaccg aggtgcacaa cgtgtgggcc acccagcct gcgtgccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgacct ccctgtgctg gggcgccggc aactgcaaca ccagcaccat caccagggcc 420
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tgccccaagg	tgagcttcga	ccccatcccc	atccactact	gcgccccgcg	cggctacgcc	480
atcctgaagt	gcaacaacaa	gaccttcaac	ggcaccggcc	cctgctacaa	cgtgagcacc	540
gtgcagtgc	cccacggcat	caagcccggtg	gtgagcacc	agctgctgct	gaacggcagc	600
ctggccgagg	agggcatcat	catccgcagc	gagaacctga	ccgagaacac	caagaccatc	660
atcgtgcacc	tgaacgagag	cgtggagatc	aactgcaccc	gccccacaa	caacacccgc	720
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atccgccagg	cccactgcaa	catcagcacc	gaccgctgga	acaagaccct	gcagcagggtg	840
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ggcgacctgg	agatcaccat	gcacagcttc	aactgcgcgc	gcgagttctt	ctactgcaac	960
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cagtactggg	gcctggagct	gaagaagagc	gccatcagcc	tgctggacac	catcgccatc	2280
accgtggccg	agggcaccga	ccgcatcatc	gagctggtgc	agcgcatctg	ccgcgccatc	2340
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<210> 123

<211> 2529

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.delV2

<400> 123

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ggcgtgcccg	tgtggcgcca	cgccaagacc	acctgttct	gcgccagcga	cgccaaggcc	180
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gccgaccaga	tgacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgcgt	gaccctgaac	tgacccgaca	ccaacgtgac	cggcaaccgc	420
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atgaagaact	gcagcttcaa	cgcggcgccc	ggccgcctga	tcaactgcaa	caccagcacc	540
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gccggctagc	ccatcctgaa	gtgcaacaac	aagaccttca	acggcaccgg	cccctgctac	660
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tgccgcgcca	tcctgaacat	cccccgccgc	atccgccagg	gcttcgaggc	cgccctgctg	2520
taactcgag						2529

<210> 124

<211> 2529

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.mut7.delV2

<400> 124

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ggcgtgcccg	tgtggcgcg	cgccaagacc	accctgttct	gcgccagcga	cgccaaggcc	180
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ttctactgca	acaccagcaa	cctgttcaac	agcacctacc	acagcaacaa	cggcacctac	1140
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aacaccgaga	ccttcgcccc	cggcggcggc	gacatgcgcg	acaactggcg	cagcgagctg	1380
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taactcgag						2529

<210> 125

<211> 2613

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.tpa1

<400> 125

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gtgcccggtg	ggcgcgacgc	caagaccacc	ctgtttctgc	ccagcgacgc	caaggcctac	180
gagaccgagg	tgcaaacgt	gtggggccacc	cacgcctgcg	tgcccaccga	ccccaacccc	240
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gtgaccggca	acagcaccaa	caacaccaac	ggcaccggca	tctacaacat	cgaggagatg	480
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taccacagca	acaacggcac	ctacaagtac	aacggcaaca	gcagcagccc	catcaccctg	1260
cagtgaaga	tcaagcagat	cgtgcgcgatg	tggcaggggc	tgggcccaggc	cacctacgcc	1320

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ccccccatcg cgggcaacat cacctgccgc agcaacatca ccggcatcct gctgaccgc 1380
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cgcgacaact ggcgcagcga gctgtacaag tacaagggtg tggagatcaa gcccctgggc 1500
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aagagcgcca tcagcctgct ggacaccatc gccatcacgc tggccgaggg caccgaccgc 2520
atcatcgagc tgggtgcagc catctgccgc gccatcctga acatcccccg ccgcacccgc 2580
cagggttcg aggccgcct gctgtaactc gag 2613

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<210> 126

<211> 2616

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1

<400> 126

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ggcgtgcccg tgtggcgga cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggcc acccacgcct gcgtgccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
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accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctaaa catcgaggag 480
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gccctgttct accgcctgga catcgtgcc ctgaacgaga acagcgaaa cttcacctac 600
cgctgatca actgcaaac cagcaccatc acccaggcct gcccgaagg gagcttcgac 660
cccatcccca tccactactg cgccccgcg ggctacgcca tcctgaagt caacaacaag 720
accttcaacg gcaccggccc ctgctacaac gtgagcaccg tgcagtgcac ccacggcatc 780
aagcccgtgg tgagcaccca gctgctgctg aacggcagcc tggccgagga gggcatcatc 840
atccgcagcg agaacctgac cgagaacacc aagaccatca tcgtgcacct gaacgagagc 900
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cgcgacggcg gcttcaaac caccaacaac accgagacct tccgccccg cgcgggcgac 1440
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ggcatcgccc ccaccaaggc caagcgccgc gtggtgcagc gcgagaagcg cgccgtgggc 1560
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atcacccctga ccgtgcaggc ccgccagctg ctgagcggca tcgtgcagca gcagagcaac 1680
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aagaagagcg ccctcagcct gctggacacc atcgccatca ccgtggccga gggcaccgac 2520
cgcatctcg atctggtgca gcgcatctgc cgcgccatcc tgaacatccc ccgcccgcac 2580
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<210> 127

<211> 2616

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.wtLnative

<400> 127

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ggcgtgcccc agtggcgaga cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggcc acccagcct gcgtgcccac cgaccccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgagt gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccaccacc gagctgcgcg acaagaagca caaggagtac 540
gccctgttct accgcctgga catcgtgccc ctgaacgaga acagcgacaa cttcacctac 600
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cccatcccca tccactactg cgcccccgcc ggctacgcca tcctgaagtg caacaacaag 720
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cgcatcatcg agctggtgca gcgcactctg ccgccatcc tgaacatccc ccgccgcatc 2580
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<210> 128

<211> 2604

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Wild-type Env  
gp160 (8\_2\_ZA)

<400> 128

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cctgtgtgga gagacgcaaa aactactcta ttctgtgcat cagatgctaa agcatatgag 180
acagaagtgc ataatgtctg ggctacacat gcctgtgtac ccacagaccc caaccacaa 240
gaaatagttt tgggaaatgt aacagaaaat ttaatatgt ggaaaaatga catggcagat 300
cagatgcatg aggatgtaat cagtttatgg gatcaaagcc taaagccatg tgtaaagttg 360
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aattgctctt tcaatgcaac cacagaatta agagataaga aacataaaga gtatgcactc 540
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ataaattgca atacctcaac cataacacaa gcctgtccaa aggtctcttt tgacccgatt 660
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caggcgagag tcctggctat agaaagatac ctaaaggatc aacagctcct agggatttgg 1800

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agtgtatta gtctgcttga taccatagca ataacagtag ctgaaggaac agataggatt 2520
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ggctttgaag cagctttgct ataa 2604

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<210> 129  
 <211> 10  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: wild-type  
 amino acid sequence changed by mutation in  
 gp120/gp41 cleavage site

<400> 129  
 Lys Arg Arg Val Val Gln Arg Glu Lys Arg  
 1 5 10

<210> 130  
 <211> 10  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: wild-type  
 amino acid sequence changed by mutation in  
 gp120/gp41 cleavage site

<400> 130  
 Ile Ser Ser Val Val Gln Ser Glu Lys Ser  
 1 5 10

<210> 131  
 <211> 2052  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: gp140mod.TV1.tpa1

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 cgcgacgcca agaccaccct gttctgcgcc agcgacgcca aggcctacga gaccgaggtg 180

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cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaacccccca ggagatcgtg 240
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gaggacgtga tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct gacccccctg 360
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ctggacatcg tgccccctgaa cgagaacagc gacaacttca cctaccgcct gatcaactgc 600
aacaccagca ccatcaccca ggccctgcccc aaggtgagct tcgaccccat ccccatccac 660
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accagctgc tgctgaacgg cagcctggcc gaggaaggca tcatcatccg cagcgagaac 840
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cgcggcgagt tcttctactg caacaccagc aacctgttca acagcaccta ccacagcaac 1200
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ggcctgatct acaacctgct ggaggacagc cagaaccagc aggagaagaa cgagaaggac 1980
ctgctggagc tggacaagtg gaacaacctg tggaaactgt tcgacatcag caactggccc 2040
tggtacatct aa 2052

```

<210> 132

<211> 2073

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp140mod.TV1

<400> 132

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ggcgtgcccg tgtggcgcca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
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ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgctg gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcactctaaa catcgaggag 480
atgaagaact gcagcttcaa cgccaccacc gagctgcgcg acaagaagca caaggagtac 540
gccctgttct accgcctgga catcgtgccc ctgaacgaga acagcgacaa cttcacctac 600
cgctgatca actgcaacac cagcaccatc acccaggcct gccccaaagt gagcttcgac 660
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accttcaacg gccaccggcc ctgtacaacc tgcagtgcac ccacggcatc 780
aagcccgctg tgagcaccca gctgctgctg aacggcagcc tggccgagga gggcatcatc 840
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gtggagatca	actgcacccg	ccccaaacaac	aacacccgca	agagcgtgcg	catcgggccc	960
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gcccccccca	tcgccggcaa	catcacctgc	cgcagcaaca	tcaccggcat	cctgctgacc	1380
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ggcatcgccc	ccaccaaggc	caagcgcgcg	gtggtgcagc	gcgagaagcg	cgccgtgggc	1560
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agcaacaaga	gcgagaagga	catctgggac	aacatgacct	ggatgcagtg	ggaccgcgag	1920
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aagaacgaga	aggacctgct	ggagctggag	aagtggaaaca	acctgtggaa	ctggttcgac	2040
atcagcaact	ggccctggta	catctaactc	gag			2073

<210> 133

<211> 2073

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl40mod.TV1.wtLnative

<400> 133

gaattcatga	gagtgatggg	gacacagaag	aattgtcaac	aatgggtggat	atggggcatc	60
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ggcgtgccc	tgtggcgca	cgccaagacc	accctgttct	gcgccagcga	cgccaaggcc	180
tacgagaccg	aggtgcacaa	cgtgtgggcc	accacgcct	gcgtgcccac	cgaccccaac	240
ccccaggaga	tcgtgctggg	caacgtgacc	gagaacttca	acatgtggaa	gaacgacatg	300
gccgaccaga	tgcacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgctg	gaccctgaac	tgcaccgaca	ccaacgtgac	cggcaaccgc	420
accgtgaccg	gcaacagcac	caacaacacc	aacggcaccg	gcatctacaa	catcgaggag	480
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gccctgttct	accgctgga	catcgtgccc	ctgaacgaga	acagcgacaa	cttcacctac	600
cgcctgatca	actgcaacac	cagcaccatc	accaggcct	gccccaaagg	gagcttcgac	660
cccatcccca	tccactactg	cgcccccgcc	ggctacgcca	tcctgaagtg	caacaacaag	720
accttcaacg	gcaccggccc	ctgctacaac	gtgagcaccg	tgacgtgcac	ccacggcatc	780
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ttccccaaca	agaccatcca	gttcaagccc	cacgcccgcg	gcgacctgga	gatcaccatg	1140
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acctaccaca	gcaacaacgg	cacctacaag	tacaacggca	acagcagcag	ccccatcacc	1260
ctgcagtgc	agatcaagca	gatcgtgcgc	atgtggcagg	gcgtgggcca	ggccacctac	1320
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cgcgacggcg	gcttcaacac	caccaacaac	accgagacct	tccgccccgg	cggcggcgac	1440
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ggcatcgccc	ccaccaaggc	caagcgcgcg	gtggtgcagc	gcgagaagcg	cgccgtgggc	1560
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cagctgcagg ccgcgtgct ggccatcgag cgctacctga aggaccagca gctgctgggc 1800
atctggggct gcagcggccg cctgatctgc accaccgccg tgccctggaa cagcagctgg 1860
agcaacaaga gcgagaagga catctgggac aacatgacct ggatgcagtg ggaccgcgag 1920
atcagcaact acaccggcct gatctacaac ctgctggagg acagccagaa ccagcaggag 1980
aagaacgaga aggacctgct ggagctggac aagtggaaca acctgtggaa ctggttcgac 2040
atcagcaact ggccctggta catctaactc gag                                     2073

```

<210> 134

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: NefD125G\_TV2\_C\_ZAopt

<400> 134

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atgggcggca agtggagcaa gagcagcatc atcggctggc ccgaggtgag cgagcgcatac 60
cgccgcaccc gcagcgccgc cgagggcgctg ggcagcgcca gccaggacct ggagaagcac 120
ggcgccctga ccaccagcaa caccgcccac aacaacgccg cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240
acctacaagg ccgccatcga cctgagcttc ttcttgaagg agaaggcgcg cctggaggggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt ggggtgtaaa caccaggggc 360
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gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgcgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgcc acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga                                     624

```

<210> 135

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: NefD125G-Myr\_TV2\_C\_ZAopt

<400> 135

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ggcgccctga ccaccagcaa caccgcccac aacaacgccg cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240
acctacaagg ccgccatcga cctgagcttc ttcttgaagg agaaggcgcg cctggaggggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt ggggtgtaaa caccaggggc 360
ttcttccccg gctggcagaa ctacaccccc ggccccggcg tgcgcttccc cctgaccttc 420
ggctggtact tcaagctgga gcccgctggac ccccgcgagg tggaggaggc caacgagggc 480
gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgcgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgcc acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga                                     624

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<210> 136

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> WTnative (8\_2\_TV1\_C.ZA)

<400> 136

Met Arg Val Met Gly Thr Gln Lys Asn Cys Gln Gln Trp Trp Ile Trp  
1 5 10 15

Gly Ile Leu Gly Phe Trp Met Leu Met Ile Cys  
20 25

<210> 137

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> WTnative (8\_2\_TV1\_C.ZA)

<400> 137

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ttctggatgc taatgatttg t 81

<210> 138

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> WTmod(8\_2\_TV1\_C.ZA)

<400> 138

Met Arg Val Met Gly Thr Gln Lys Asn Cys Gln Gln Trp Trp Ile Trp  
1 5 10 15

Gly Ile Leu Gly Phe Trp Met Leu Met Ile Cys  
20 25

<210> 139

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> WTmod(8\_2\_TV1\_C.ZA)

<400> 139

atgcgcgtga tgggcaccca gaagaactgc cagcagtggg ggatctgggg catcctgggc 60

ttctggatgc tgatgatctg c 81

<210> 140  
<211> 25  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Tpa1

<400> 140

Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly  
1 5 10 15

Ala Val Phe Val Ser Pro Ser Ala Ser  
20 25

<210> 141  
<211> 75  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Tpa1

<400> 141  
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tcgcccagcg ccagc 75

<210> 142  
<211> 23  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Tpa2

<400> 142

Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly  
1 5 10 15

Ala Val Phe Val Ser Pro Ser  
20

<210> 143  
<211> 69  
<212> DNA  
<213> Artificial Sequence

<220>



<223> Tpa2

<400> 143

atggatgcaa tgaagagagg gctctgctgt gtgctgctgc tgtgtggagc agtcttcggt 60

tcgcccagc 69